Naval Surface Warfare Center, Dahlgren Division
Interview with Tom Clare
Conducted on May 1, 2003, by Rodney P. Carlisle

RC: This is Rodney Carlisle interviewing Dr. Tom Clare, May 1, 2003, at the Headquarters Building at Dahlgren. Why don't we start with you telling me a little bit about your educational background as a civilian in the Navy prior to becoming a TD.

TC: Well, I was at the University of Notre Dame and I received a master's degree. My first association with Dahlgren was . . .

RC: When was that?

TC: In 1967. Excuse me. I received a master's degree in '67, yes, that's correct. Then my first association with Dahlgren, ironically enough, was as a student. My officemate was on full-time advanced study from then the Naval Weapons Laboratory, and he was getting his Ph.D. I inquired as to how that arrangement occurred, and, to make a long story short, I applied for the full-time study program even before I got here, as ignorant as that would sound, but I was doing it out of ignorance. I didn't realize you had to work here first.

The then-technical director, Barney Smith, apparently had gotten word that I was a good student or a good candidate or something, so they found a way to support me. It was ironic; they hired me as a GS-9 aerospace engineer with a master's degree, and my job, my

position description read, to attend the University of Notre Dame and get my Ph.D. So they did not pay my tuition or anything; they paid me a salary. I was the GS-9 . . .

RC: Which is even better.

TC: Well, it wasn't really. Normally, you'd get paid your salary and then you're sent to school, but, of course, I didn't know any of this. I was just a naïve kid.

RC: You just thought it would be like a scholarship.

TC: But it gave me an indication of Dahlgren right off the bat, which was, Dahlgren was innovative and aggressive and took initiative.

RC: And that was in '67?

TC: '67. So I was hired as a GS-9 aerospace engineer, and my job was to attend the University of Notre Dame and get my Ph.D., and it took me about two and a half to three years to do that.

RC: And your B.A. was from . . .

TC: Was Notre Dame. Bachelor's and master's was from Notre Dame.

RC: And what were their titles?

TC: Aero engineering. All aero engineering.

RC: Fantastic. Okay.

TC: So anyway, I got my Ph.D. in 1970, and came here to Naval Weapons Laboratory and began doing research and technology in aerospace engineering.

RC: And what division were you in?

TC: I was in the Exterior Ballistics Division, actually. It was called KB at the time, and it was in K Department. Then I was asked to lead up the formation of a new branch of aeromechanics people, because they had a reorganization in '67, and most of the aero people went over to G Department as part of the Guided Projectile Initiative. There were no aeros left in K, where a lot of exterior ballistics was done. So Ralph Neiman, who was the department head—and my division head—they said they wanted to form a new branch and would I head it up. So I started a branch with nobody in it, and hired and recruited. That was my introduction to management. Of course, they sent me to some classes and stuff and training but, nevertheless, that was how I got into management. So I was doing that for a year or two, and got a small branch going of about a couple of dozen people, most of whom I hired myself, since there wasn't anybody to start with.

RC: And what was the function of that branch?

TC: It was aeromechanics, was the name of it. Then my division head went away on a NSAP assignment and I was assigned to be acting division head, and I did that for a year, year and a half. Then, again, my department head, Ralph Neiman—who was one of my mentors—told me that I should get out of K Department, get out of Dahlgren, get some experience. I didn't know how to take that, of course. I didn't realize he was doing me a favor, but I felt it strange that if he thought I was such a good person, why did he want me not in his department. That's when I learned what good managers do.

RC: Yes, they sort of keep an eye on their junior people.

TC: Well, they take their best people and they make sure that they get opportunities, even if it's not focused just on their own business. So he encouraged me—almost ordered me—to go to the fleet as a science advisor, so I went on the NSAP Program for about a year and a half and was science advisor at SURFLANT, COMNAVSURFLANT in Norfolk, Virginia.

I came back here, having done a pretty good job there and surprising myself, because my only background was this aero stuff. The Naval Surface Weapons Center had been formed just recently in 1974, and the leadership at that time was moving the center in the systems business, because we were mostly components. I mean, we were in small systems, but we were in mostly components. That was Jim Colvard and C.J. Rorie were

the TD and CO at that time; C.J. was the CO and Jim Colvard was the TD. Anyway, they were going to get involved in the Aegis Program, and they needed somebody to lead up the Aegis Program.

Well, again, my department head—I came back to K Department, expecting to go back and run the Exterior Ballistics Division, and Ralph Neiman said he wanted me to leave the department again. He thought that I could do better service for the center heading up this Aegis Program. I didn't even know how to spell Aegis. I didn't have any of the background. I was an aero kind of guy. Didn't have an electronics background or anything like that.

RC: And for a while, they would say Aegis and they wouldn't say what it was about. It was rather classified for quite a while.

TC: I guess so, but at this time it wasn't. But nevertheless, so again I thought, "Why is Ralph kicking me out of K Department?" Nevertheless, I went and applied for the job, and I was selected, and I became the first Aegis program manager. So I was right in the middle, then, of the transformation of NSWC, Naval Surface Weapons Center, from a component-oriented organization to a systems organization, right in the middle of that, right on sort of the tip of the spear in Aegis, because Aegis was the tip of the spear at that time.

RC: In terms of systems approaches.

TC: Yes. I mean, everybody was trying to figure out what it meant. Nobody really knew. Admiral Wayne Meyer [inaudible], who was another one of my mentors, knew, of course. He was the Aegis program manager, but certainly I didn't know, and not too many people at Dahlgren knew.

RC: I have a concept of it, but suppose you were a general reader who was trying to understand what Aegis was all about, and you only had a hundred words or so to give it a short definition. How would you give that focus?

TC: I would say Aegis was the program and the system that transformed the surface Navy into a unified ship as a system approach. It took the ship and made it a system. That would be the bottom line. I mean, if you really wanted a bottom line, that was it. Now, a lot of sophisticated nuances that go into that, but it really took what was before a compartmented sense control and engage set of functions on a ship and ship design and ship integration, and brought it all together under common management, common leadership, and produced a fleet, today, which is beyond any other surface fleet in the world, any other surface fleet the Navy has ever had by orders of magnitude. Now, technologically . . .

RC: So it works. It actually works.

TC: It works and it's . . .

RC: I think a lot of people were skeptical.

TC: Oh, they were, of course, as they are about anything new.

RC: Sure. Well, you saw that with the armchair generals during this recent event.

TC: It's human nature.

RC: Sure. But that's a good—okay.

TC: So I was in the middle of that. So I was heading the Aegis Program, and I was a division head at the time, as well as the program manager. Well, I learned a lot about system engineering and a lot about leadership and management. Again, a lot of education and training, because Dahlgren was very big then—and still is—on insisting that its leaders and managers get education and training in leadership and management. Anyway, in 1979, I was reassigned as the deputy head of the Electronics Systems Department. I'd been in Aegis about three or four years and I was kind of burned out, to tell you the truth, because it was pretty high pressure and I was doing a lot of traveling. It was a lot of pressure on a lot of fronts, externally and internally.

Then in 1980, I was selected for Senior Executive Service membership, and my first assignment was head of Combat Systems Department, which is where Aegis was located,

by the way, at least the headquarters of Aegis. Aegis was a centerwide project. It had funding in the all the departments, but the leadership and the management, the focus of it was in that department. So I did that for three years. Then I was reassigned as part of the continuing executive rotation program to the head of K Department, strategic systems. It was then called strategic strike systems. I can't remember the exact title, but it was K Department. Tomahawk was, of course, there and SLBM, which was moving into the Trident building, was there.

But also a major thing that was going on besides Trident was the beginnings of the Tomahawk Program. So Tomahawk was just beginning and it was in some trouble in 1983 for a lot of reasons I won't go into. So one of my major tasks when I was reassigned there was to get Tomahawk on the right track. Not that the people weren't—the leadership that I replaced was part of the issue. Then I was reassigned about 1986 to the executive development slot on the technical director's staff, which was a rotational assignment outside the lab, and I went up to SPAWAR and spent the year and a half at SPAWAR in helping begin the warfare systems architecture.

RC: That had just been set up.

TC: That's correct, by John Lehman. Helping start the warfare systems architecture and engineering business, which was a new initiative, frankly, a decade ahead of its time, and it

was not that successful because it was not perceived to be needed, but it certainly is needed today.

RC: In a sense, it's taking the systems approach from the ship to the fleet.

TC: Exactly. Well, to the whole warfare arena.

RC: Yes, that's right, including the Army as well.

TC: Well, yes, but even just within the Navy, it's hard enough. And the Navy wasn't ready for it, and it didn't embrace it. The top leadership, Lehman—I'm not a big John Lehman fan, but he was right about that, in my opinion—but, nevertheless, the Navy wasn't ready for it and it wasn't very successful.

RC: But it seems to have worked in the . . .

TC: Subsequently, it has, in its reincarnation in the last five years.

RC: Yes, it's fantastic.

TC: It's gotten better, but not then. It's gotten better.

RC: Oh, okay. You don't want to get too enthusiastic. [Laughs]

TC: Right. But I then came back and was reassigned to the Engineering Department, and the Engineering Department was a split site between Dahlgren and White Oak. In 1989, I was selected to be the technical director of then the Naval Surface Warfare Center. It became the Naval Surface Warfare Center in about 1988 or '87, I think. I don't remember the exact year. So we were the Naval Surface Warfare Center, still a member of the DNL—Director of Navy Lab—community, and I was selected technical director to relieve Lem Hill in 1989. Of course, right around that time, the cold war ended and the Navy began realigning itself, including realigning the then labs with the systems commands as part of new warfare centers, as they called them. We used to call them mega centers. But we were, of course, the Naval Surface Warfare Center and that was one of the titles they wanted, so the Naval Surface Warfare Center became the name of the big center up in headquarters, and we became the Dahlgren Division of the Naval Surface Warfare Center.

At that time there was a lot of realignment done, and the powers-that-be, for some reason, aligned Panama City and Dahlgren together. We were not a fan of that, not because of Panama City. Frankly, my view was, Dahlgren and White Oak was enough. There was 5,000 people and however many hundreds of millions of dollars of budget at the time, pretty broad spectrum of mission, two major sites, one in an urban area, one in a rural area, you know.

RC: You had enough on your platter.

TC: Yes. I was not a fan of that, and it had nothing to do with Panama City. It could have been anybody. I was just not a fan of expansion. Now, some of my peers in other organizations were, and they just would go trying to grab up as much as they could. I was trying to resist it. But, nevertheless, the powers-that-be decided Panama City should become . . .

RC: Hadn't that been briefly attached to David Taylor?

TC: Oh, yes, way back. In the early seventies. Panama City was the smallest of the labs.

RC: So it was kind of an orphan.

TC: Yes, in a way, unfortunately. But, nevertheless, that's what it was. So anyway, we became aligned with them and that was a whole new era. So I was technical director from 1989 to 1998, because I retired in 1998, and I guess I would say that my career as technical director was characterized by a few major themes, one of which was base closure.

RC: Yes, that's on my list. You've got my list of questions in your head already. Go ahead.

TC: There were two to three rounds of base closure going on, and, frankly, it just consumed me, as it should have, but it was not what I was anticipating, to say the least, when I applied for the job in 1989.

RC: Yes, so you got more into managerial survival questions.

TC: Well, it wasn't managerial. I expected the job to be managerial and a lot of leadership, but I expected to be focused on the quality of the product coming out of the lab and its relevance to our customers.

RC: Rather than organizational questions.

TC: Rather than keeping the organization alive and not being closed. There's a big difference. So, I mean, they're related, of course, but they're totally different. So that was one dominant theme. Another dominant theme was the merger with Panama City, and that was pretty rough.

RC: Let me ask you a couple of quick questions about these issues. What do you think of the rationale of the mega centers? What was your view of the concept of making larger centers?

TC: I was not a fan of it for a lot of reasons, one of which, I'm not necessarily a believer in the philosopher that bigger is better. I do believe there were some positives for it. There were obviously some good things that came from it, but on balance, I wasn't a big fan of it. I was not a big fan of these centers being aligned with the systems commands at that time either.

RC: That was a question that has always bothered me, about the alignment with the systems commands, because it seems there was a conflict between the concept of naval industrial funding, or DBOF, where you're getting your program money out of program officers and yet you have this nominal control by NSWC. It seems that you don't have the person controlling the purse strings; the purse strings are being controlled by the program officers.

TC: That's correct.

RC: And the nominal management is in the systems command.

TC: Well, not really. Goldwater-Nichols was the other major event that occurred in the late eighties that separated the acquisition from the operational community, and it created, in the Navy's way of doing it, they created these PEOs—program executive officers—that had administrative management functions over a collection of program managers, and they were the ones with all the money and still are today.

RC: That's what I meant.

TC: They had all the control.

RC: Right.

TC: The systems commands were intended to be the resource managers that enabled and sort of supported the PEOs. They provided contracting, skills, financial management skills, administrative skills, logistics skills, and including the technical communities, the centers, the warfare centers. Now, from that standpoint, it was a consistent philosophical move. My reason for being concerned about at least the R&D-oriented activities moving under the systems commands was that at the same time you have to remember the technology base business was removed from the systems commands as well in that era. The 6-2 money used to be controlled and influenced significantly by the systems commands. Well, that went over to ONR. In fact, it became ONT, Office of Navy Technology. So now the systems commands are completely focused on the near-term, as I could see it. Their primary focus was on the near-term.

RC: The 6-3 and . . .

TC: Well, even beyond that, even 6-3 was beyond that, I think, but it was relatively near-term stuff. And I grew up at this institution, and others like it, believing that the Navy wanted

organizations like this to anticipate the future and to have a balance between what it did in the near-term and what it was preparing for in the long-term, and to make the necessary investments in people, equipment, facilities, and capabilities, so that the Navy would have in place what it needed in the future, with a wide uncertainty of what would happen.

RC: Yes, and that's the 6-1 and 6-2 step, yes.

TC: Well, it wasn't just 6-1.

RC: It's not just the money.

TC: Aside from the money, it's the whole mentality of how you run the business. And I was very concerned that that philosophy of balancing near-term and short-term needs, coupled with being placed under an organization that seemed, at least to me, to value near-term needs almost exclusively. And I'm not being critical of them. That was their business, and they did a good job of it, but there was a significant mismatch. So I was not a fan of that. So those are my reasons. So my time there was dominated by this transformation into these warfare centers, and survival in BRAC, and the marriage with Panama City, and downsizing.

RC: Yes, the RIFs.

TC: Just downsizing in general because the cold war was over. So it was filled with great uncertainty.

RC: It must have been kind of ulcer-producing.

TC: Well, it was. I mean, I didn't have an ulcer, but it was a highly stressful time.

RC: A lot of tension.

TC: What Tom Pendergraff has today is no less stressful. I mean, it's just different. He's got an upcoming . . .

RC: Yes, a lot of people thought it killed Roger Smith.

TC: It may have. I mean, I don't know what killed Roger Smith. I know he had some sort of a disease that they never figured out.

RC: That's exactly right.

TC: And I don't know if it was stress-related or what, but Roger was . . .

RC: Well, people felt that the stress contributed to whatever it was. I mean, that was sort of the feeling over there.

TC: Well, Roger running Indian Head, that was even more stressful for a lot of reasons. I mean, they didn't have mergers with other organizations to worry about, but they had a very cloudy business base. We were blessed here, based mainly on what my predecessors had done. We had a strong base, and I think I made some significant contributions and strategies through BRAC, aligning ourselves with our customers.

RC: Yes, why don't you go into that a little bit. Tell me some of the strategies that you think helped survive the BRACs.

TC: Well, Dahlgren was unique, and Panama City, to some extent, were unique—and Dahlgren even more than Panama City—in that we had nothing to keep us here other than the river, the way I looked at it. People didn't want to hear that, but that was the truth. There was nothing physically—physically—to keep us here as there was, let's say, at a place like Carderock, that may have this tow tank capability that's built on a certain geography and . . .

RC: Can't move it.

TC: Can't move it, kind of thing. Well, you can't move the Potomac River. I understand that. But there's not much else here that you can't move. You may not get the people to go with it, which, of course, was our strength, was our intellectual capability. However, the people in Washington . . .

RC: They figure they can move them like chess pieces.

TC: People running the BRACs believed that the individuals could be moved pretty freely. It turns out that was not the case. We told them it wasn't the case, and when White Oak was closed, we saw that. And when some of these other places were closed, they saw it. I don't know what the percentages were. You can go back in history and find out, but I think it was like 20 to 25 percent, people moved. That's pretty much what we told them would happen.

RC: Well, I think they were thinking militarily, where, you know, the guys in uniform are switched every two years and they just go. But the civilians . . .

TC: That's not why people join the civilian workforce.

RC: Right. They join it for stability, quite the opposite of mobility.

TC: I used to go to meetings in Washington all the time on that exact subject. They'd say, "What about the military?" I'd say, "More power to them. I'm the biggest fan of the military there is on the planet, but that isn't for me. That kind of life of moving around . . . ."

RC: That's why you're not an officer.

TC: That's why I'm not in the military, one of the reasons. So, you know, don't expect people to go. I mean, they'll resign or they'll do this, that, and the other. Anyway, people were not considered the highest resource, most precious resource, during that process, that's for sure. Nevertheless, so we had to come up with a strategy that made us somewhat unique, independent of our physical surroundings, and the only thing we had going for us, I thought, was our intellectual capability, our technical capabilities, which we established in the early nineties a vision which was oriented toward something that industry could not do.

See, you've got to remember, at that time not only were the BRACs coming, but there was a philosophy to farming things out, and still is, to industry. So to the credit of our board of directors, we had a series of strategic planning sessions, which we have had before that and I'm sure they still have today, periodically doing our strategic planning update. And about every two or three years, we would do a cycle of strategic planning. We would revisit what our vision was and our strategy and everything.

Well, of course, as we were facing these BRACS, it was very germane, and the key question on the table, what is it that we should be that would keep us that's something that industry could not do? And we came to the conclusion that that was manage large, complex systems. And it's not that industry couldn't do it because they were incompetent. Certainly they're as competent—and some say more competent—than we were. The difference is that industry has something that we don't have, which limits their capability to deal in large, complex systems, and that's called competition. As long as there's competition, that's going to be an inhibitor to what makes a system a system.

RC: Why? What's the rationale there?

TC: What makes a system a system is relationships. That's what makes a system a system. You can have a hundred parts sitting in a room, and if there's no relationship among those parts, you don't have a system. They can be the best radars and the best missiles and the best launchers and the best computer programs and the best displays and the best ship, and if they're not interrelated, consciously and intentionally, in a consistent fashion, with a common objective, they're not a system.

RC: And that's inherently contradictory to competition.

TC: I think so.

RC: To bring that down one notch to help understand it, are you saying, then, that in a system where a corporation's trying to run it, they might say, "Well, I don't want my competition to make this part?"

TC: Exactly.

RC: "I've got to make it with one of my subsidiaries rather than one of their subsidiaries."

TC: Yes. "I don't want to lose the business," or, "I may make the radar and somebody else makes the missile. I don't want to share information, secrets," etc. There are built-in—and I'm not saying competition's bad, believe me. Competition's good. I think competition is a good thing in this country. What I'm saying is a byproduct of it is barriers to good system engineering, which is built on relationships. Relationships, relationships, relationships.

RC: Actually, I hadn't heard anybody express this concept before. Was this sort of well and widely understood in the Navy lab community or is this particularly a view that you held?

TC: I don't know whether this was widely held in the lab community, because the other labs didn't embrace it. I don't know whether they knew it and didn't embrace it for a lot of reasons. We were in the systems business already.

RC: Sure.

TC: Other labs were not as much in systems; they were in piece parts of systems.

RC: Well, some of them . . .

TC: Complex systems, missiles, China Lake missiles, but not in total systems.

RC: Not in systems integration.

TC: Yes. other labs in radars, there are other labs in ships, there are other labs in electronics, but no one was in the systems. We were. And I didn't put us into systems business; my predecessors did. As I said, Aegis was the launch point. Of course, Trident and SLBM was really our first entry into systems and Aegis expanded that.

RC: So are you saying, then, that perhaps because of your personal background and also the background of Dahlgren, that you were more sensitive to the conflict between private enterprise competition and systems approach than the other labs? Am I just restating what you said?

TC: Maybe. Again, I never put it in the context of competition with the other labs.

RC: No, no, I didn't mean that.

TC: We were focused on what was Dahlgren's vision.

RC: No, I meant to say you were more sensitive to the inability of the private sector.

TC: I don't know that. I just know we were sensitive to it. You say we were more sensitive to it. I don't know whether we were more sensitive. I never went to my peers and said, "Are you sensitive to this or not?" I never asked that.

RC: Okay.

TC: So I'm not trying to be cute with you, I just don't want to come across as being better.

RC: Yes, I understand. This never got kicked around at the NLCCG?

TC: Well, I'll tell you a little about that in a minute.

RC: Okay. Go ahead.

TC: Not quite at the NLCCG, but it did at something else that was very close to that. So you asked me what my strategy was in BRAC. I'm explaining that we focused then—and it

wasn't just me, it was our board of directors. We had a wonderful group of people, who were very outspoken, very creative, very—not perfect; none of us were perfect. But I'll tell you, in the early nineties, when we—again, this included the department heads of Panama City and Dahlgren that I'm speaking of—and White Oak—I think White Oak was open—who was on the board of directors, this is support departments and technical departments. We would go away, as I said, twice a year on these strategic planning sessions and that's where we did this work, on these weeks that we took, these three or four days we took away.

But we came to the conclusion that the thing we could do better than private industry was manage large, complex systems, and we concluded that because of competition—and this was because of competition—that the government needed to play an inherent role in the leadership and management of system engineering for the Navy. And we wanted to be the leader of that community in the Navy, and that's how we staked our identity.

RC: So it sort of came out of the BOD meetings.

TC: Not "sort of," it did. It came out of the BOD strategic planning activities. We didn't call them meetings. They're having a meeting downstairs now. I don't know what they're talking about, but they're probably not talking about this.

RC: But this would be the strategic planning session, where you'd have a real brainstorming session for two or three days.

TC: Well, actually, it was a continuous process. It occurred twice a year, roughly, and two or three days each time, and we would discuss these kinds of things.

RC: That's very interesting. That's a very interesting point, because it speaks to a lot of the larger issues that will be themes in this book.

TC: Yes. So we thought—again I've got to reemphasize—it wasn't that industry's not capable; it just was inconsistent with their mission and their objectives, and was consistent with the Navy's objectives. So we established our identity and vision to be the Department of the Navy's Warfare System Engineers. That was our vision. DON Warfare System Engineer.

As a matter of fact, as a matter of correctness, our initial vision was the DOD Warfare System Engineer. That's what we thought was needed. Somebody had to stand up and be the system engineer for the DOD, and we were ready to do it, because DOD was not capable of doing system engineering. It's not set up to do it. It's not that they're incompetent; they're just not set up to do it. And as systems got more joint, like you said, with the Army and the Navy and the Air Force, somebody at DOD had to lead this activity, and DOD was not set up to do it. We saw that.

RC: Is that going on now?

TC: To some extent only in one area, in Missile Defense Agency, and they're really struggling. As a matter of fact, I'm doing some consulting work with them, right as we speak, on that exact subject. But, nevertheless, that wasn't in place at the time. It became politically unacceptable for a Navy Warfare Center division to have a vision that was a DOD vision. The Navy didn't want to deal with that, and so we changed it to DON Warfare System Engineer.

RC: What about DDR&E? Don't they have that function at all?

TC: No.

RC: No. They can't handle it?

TC: Well, they have the function. As a matter of fact, they do have the function, but it's an administrative function.

RC: Not a technical one.

TC: No. They have a deputy under secretary for system engineering and all that.

RC: But that's a Pentagon office.

TC: It's policy kind of stuff. There wasn't any teeth in it.

RC: It was not a shop.

TC: There wasn't any teeth in it. So anyway, that was our rallying point, and that created a whole set of dynamics in our relationship with our customers, in our responsiveness to BRAC, our rationalization for our work balance, our investment strategies. It was the cornerstone of everything we did during the BRACs in the nineties. We had a lot of employees, by the way. One of our big jobs was selling our employees that this was a good thing. And our employees were very skeptical, as they should have been, because when we stood up in front of our employees, which we did very frequently, and explained our vision, just as I explained it to you, they said, "Gee whiz, Tom," or, "Gee whiz, Captain, don't you read the papers? Lockheed Martin's buying up everybody. There's not going to be any more competition." Remember that?

RC: Yes.

TC: Well, in the early nineties, this was when it was going on. Remember everything was downsizing, they were buying up these companies, and all the companies were disappearing.

RC: That's right.

TC: We said to our employees, "We do not believe that that trend will continue. If the competition in the defense industry goes away, then we need to find another job because our jobs will not be needed." And people accepted that. They didn't like it. They were worried about it a little because they saw things being scarfed up, but they accepted it. And we bet the ranch on competition in private industry, and therefore, creating the need for a systems-oriented organization. You know, the analog that I would give you is like an orchestra leader. We wanted to be the orchestra leader of the technical community in the Navy from a systems point of view. Now, to do that, we needed to know something about the various instruments in the orchestra, but we didn't have to know everything about all of them. So we established a core strategy as to what we needed to be good at.

RC: But when you go from complete ship integration and then even warfare integration, there are parts of the ship, even, that don't fall in the purview of Dahlgren at all, like the HMSE.

TC: Oh, absolutely, and that's exactly my point.

RC: HMSE or . . .

TC: HMSE . It's all about relationships. What we tried to do wasn't as successful as I would have liked in that particular case. We got into this total ship system engineering business,

and we had a bit of a competition with Carderock over who would be the lead activity for total ship system engineering. And that didn't mean who was going to do it all, but who was going to be the orchestra leader. We weren't going to play all the instruments. We were going to play some of the instruments, but not all the instruments. So that went on for some time and I think Dahlgren emerged as lead in that capability. And it wasn't trying to beat Carderock; it was a philosophical difference. What drives the overall design of the ship as a system? Is it mobility, containment, and structures? Mobility, containment, and support systems, which is the better way of putting HMSE, or is it the warfare system or the combat system? We believed, probably biased, that it was the warfare system. Carderock believed, probably biased, that it was the mobility, containment, and support systems.

RC: Getting the ship there and you were thinking of fighting the ship.

TC: Exactly. So that was the philosophical difference. Now, there was never a victory declared or any kind of a decision made. It just, with the nature of the workflow, seemed to favor what we were doing.

RC: But your approach would be a little bit philosophically closer to the blue-suit folk who conceive of themselves as warfighters.

TC: I would think so.

RC: Rather than transportation people.

TC: But on a broader scale, we established this vision in the early nineties, and after several years, we were using it successfully. We fended off one BRAC and, unfortunately, in a second BRAC, White Oak got hit and closed. But nevertheless, we were still, as an institution—except for that—doing pretty well. Panama City seemed to be thriving.

RC: But you got the White Oak—actually, the White Oak functions were split around, distributed a little bit.

TC: Indian Head, Panama City, and Dahlgren, pretty much.

RC: Actually, Carderock got a couple hundred . . .

TC: That's right. Carderock got some . . .

RC: They got two or three hundred people.

TC: Absolutely, yes. I don't want to minimize. They got more than that. But anyway, Carderock, Indian Head, and Panama City, and Dahlgren. But we then saw DON—remember the DON warfare system engineering vision. In order to do that, we had to build relationships. Back to my relationships, which is the essence of a system, we

had to build relationships with other Navy activities that were engaged in air systems, undersea systems, command and control systems, right?

So I called around to all the technical directors in the Navy. This was around 1996 or so. I called all the technical directors in the Navy—including NRL—and explained in words what I'm basically explaining to you here, except I went into it in more detail, about the need for us as a community to come together to focus on a common systems approach to these issues, and that the administrative structure we worked for, the warfare centers, were not dealing in these things. They were—and I'm not being critical—they were understandably and necessarily dealing in things like high grades and billing accounts and ceilings and all those things, which is what the system was demanding of them. And they did us a great service, NSWC headquarters did us a great service in the field by fending off all that stuff.

Meanwhile, I told them, the other lab directors, that, you know, we never had the opportunity to come together to talk about common systems issues as a community. The only time we came together as a community was to fight over something. And ever since the DNL community went away, that forum seemed to not be there. Now, the NLCCG was an attempt to do that. My take of the NLCCG is that it was galvanized by the pressure on the technical community when they were fending off stuff. They were in defensive mode, as they should have been—and I'm very happy and thankful they were—and they weren't dealing in these technical issues—system-wide technical issues. I'm not

talking about getting down into the nitty-gritty; I'm talking about system concepts across the whole community. Every one of the TDs—and there was like twelve or fourteen of them—Pax River, China Lake, Carderock, Indian Head, Newport, Keyport, NRL, SSC San Diego—then called NOSC, EOD Tech Center. I don't know if I said Pax.

RC: You did.

TC: Anyway, it was about ten or twelve of them, and every one—Crane—everyone of them indicated that I was correct, that there was not a forum where the technical community came together, there should be, etcetera. So I created—and I just named it myself—the Naval Warfare Systems Forum. And the documentation exists—my former secretary, Diane, probably has the stuff in a file somewhere—of the first letters I sent out to all the TDs inviting them to the first meeting of the Naval Warfare Systems Forum, which would be held at Dahlgren, right downstairs in the Virginia Room. I don't remember when it was, but I think it was '96, or somewhere in there, maybe '97. I can't remember. And that was Naval Warfare Systems Forum I.

Before I retired, we had about five or six meetings. We named them like Superbowls, you know, I, II, III, IV. And the purpose of them was to arrive at common strategies in dealing with system-wide, Navy system-wide issues. And it turns out, even after I retired, I had some feedback, that there was still some positive things going on there, that communities like [inaudible], Dahlgren, and two or three others had come together in the

area of strike, surface strike, or land attack, I guess it was, with a common approach, and some of the admirals, who would be sitting in their offices—these were some anecdotes told to me after I retired—these five activities would walk in together with a common proposal that had to deal with land attack in the Navy, and the admirals were just flabbergasted.

RC: Because they'd never seen that before.

TC: They'd never seen this community come together like this.

RC: Yes. Because they'd always get this competition.

TC: They'd always been competing. So I feel like that was a good thing that I did.

RC: I think I have the distinction between the NLCCG and the forum in terms of their approach. I guess the NLCCG was more strictly administrative matters?

TC: I wouldn't say strictly, but it was focused on administrative matters, as it should have been.

RC: And survival.

TC: And survival. Absolutely. And this forum was focused on systems engineering and systems management.

RC: Did you bring together the TDs?

TC: All the TDs.

RC: So it was the same group.

TC: Absolutely. Every time. It was the TDs of all the field activities.

RC: Of the field activities, whereas the NLCCG was . . .

TC: The TDs of the mega centers. The COs.

RC: And these were only TDs at the forum.

TC: That's right. It wasn't excluding COs; it was just a matter that the topic was focused on the system engineering and technical issues. COs were always invited; they just never came.

RC: Yes, because they were more concerned with the administrative questions.

TC: Well, yes, as they should have been, I'm sure. No, this was clearly a role where the TD was the principal. It was a technical focus. Actually, the EDs was the correct . . .

RC: The EDs. That's right. So you got the little places to come. I see.

TC: Panama City.

RC: So you moved down one level.

TC: Exactly. All the sites.

RC: And how many were at the forum?

TC: About a dozen. About a dozen, and amazingly enough, with very few exceptions for the five or six that were in place when I was here, very few people were no-shows. People put it as a high priority on their calendars and they showed up. I was very impressed with that. And I think the meetings were pretty good. It got people talking about things that were of common interest. I mean, remember what a system is. It has to have a common objective. We never, as a community, had a common objective.

RC: Did you feel that when there had been a DNL community, that both the administrative and this technical side had been covered at the DNL level?

TC: I wasn't TD long enough when there was a DNL to know. It was only a year or two.

RC: Am I putting words in your mouth?

TC: There was a little bit more of it there than there certainly was in the current mode.

RC: I'm just trying to look at this sort of structurally. Maybe I'm oversimplifying it, but when the DNL goes away, the NLCCG picks up one half or picks up the administrative and survival side and . . .

TC: That might be a little too much of an oversimplification.

RC: Yes, and then the technical integration side goes into a vacuum for a while until you start the forum.

TC: But keep in mind, also, times were changed in the nineties than they were in the eighties, so in all fairness, I mean, the NLCCG did a good thing. It, unfortunately, was rooted in the—Jerry Cann, whose idea it was, but when he left, it kind of petered out a little bit, I think.

RC: I observed some of that, because I was doing a couple of little history contracts for the NLCCG, with Mike Marshall and Howard Law, so I learned a little about that as it was

going on. I've told that story to some extent in a couple of publications, but they're not being sold in drugstores.

TC: I would think it's an oversimplification to characterize it the way you did. The DNL community did focus on technical more so than the current community. There's no question about that, but it wasn't . . .

RC: But that was before the systems question had come to the forefront.

TC: Well, it wasn't so much that. It's just before the base closure. It was base closures became a . . . and you've got to remember, I think, to some extent, once the technical communities moved into the system commands, I think there's been an identity crisis in these communities.

RC: Well, that's something that has come up at the other places. There was a lot of resentment, I thought, at Carderock about the establishment of the systems command, and the loss of their name.

TC: Not the systems command. You mean the warfare centers.

RC: I mean the warfare centers, yes.

TC: Don't read resentment in my part. I'm not saying that. My issue was not the Naval Surface Warfare Centers. My issue was the alignment of these technical activities with the systems commands, given the fact that the systems commands were focusing more and more on the near-term, and I did not believe the systems commands, given the culture and their mission in life, which did not involve any R&D hardly anymore, would cause the technical communities, like Dahlgren and China Lake and Carderock and the rest of the labs, to have an identity crisis, and we did.

RC: Now, some people have expressed that, and you're not putting it this way, as sort of almost like the difference between science and engineering.

TC: No. It's not that simple.

RC: No, I can see that it isn't, but it sort of parallels that a little bit in the sense that science thinks about basic principles and doesn't worry too much about immediate applications. A lot of the people at Carderock would express what you've expressed in those science versus engineering . . .

TC: Yes. I would not put it in those terms. To me, science and engineering together can be used to deal with current issues and can be used to anticipate the future, and I'm not making a distinction . . .

RC: This may be a little bit of change. Actually, what you've said about management is very interesting, and I'm going to make good use of this. I've almost written my chapter for the 1990s. But one thing that the public would be interested in is, were there any direct applications of Dahlgren systems in Desert Storm?

TC: Oh, absolutely. Lots.

RC: Can you tick off a few?

TC: Well, some dealt with the identification issues on those—I know for sure they dealt with the ability to—remember, we were accidentally shooting our own vehicles on the ground?

RC: Oh, yes. Right.

TC: There was an identification system developed.

RC: From the [inaudible], yes.

TC: That was one. Another was electromagnetic effects, E^3, HERO—Hazards of Electronic Radiation to Ordnance. Big-time issues there. Those are two that come to mind. There was a lot of classified stuff that I can't tell you, that came out of places like J Department, that were definitely an influence in Desert Storm.

RC: Well, you can't tell me on tape, but I've got a clearance, but . . .

TC: Okay, well, you can find out.

RC: I wouldn't be able to use in the book anyway.

[End Tape 1, Side A]

[Begin Tape 1, Side B]

TC: . . . developed the weapon control software, for all intents and purposes, that launched Tomahawks from VLS launchers, on surface ships. That was a very, very successful part of that . . .

RC: And, of course, it played a part in Gulf War II.

TC: Gulf War II, of course, but clearly Gulf War I was dominated by the ground war, but of course, that was set up by the air at in the beginning. Nevertheless, in Desert Shield/ Desert Storm, there were a lot of contributions from Dahlgren. Tomahawk was one of them, Aegis was another. The Aegis system performance, which, of course, Tomahawks were fired from Aegis ships as well as other ships.

RC: So in a sense, it was the first blooding, you might say, or the first test in a real-life situation of Aegis. Or is that an exaggeration? Had Aegis been used in battle scenarios before?

TC: I really don't know. I'm trying to remember.

RC: Any other little operations?

TC: I don't remember.

RC: But this is certainly a major . . .

TC: Oh, yes, yes, they were. Aegis ships were used in the Libyan conflict. Wasn't there a Libyan . . .

RC: Yes, there was. There was a bombing raid on . . .

TC: I think so.

RC: That was early in '80.

TC: I don't remember whether Aegis ships were part of the battle force or not. At that time, in the mid-eighties, there were few Aegis ships. There were only a few of them at that time, so I don't know whether Aegis was really in play at that time. But nevertheless . . .

RC: But it is the first major, significant use.

TC: Probably, yes.

RC: I mean, we could probably track down, there may be an Aegis ship here and there in other little minor operations. Who were some of the outstanding characters—you've mentioned a couple along the way—that you dealt with, either here or at the next level up. We've been talking about principles and ideas and we haven't put people . . .

TC: Well, I would say Admiral Wayne Meyer was the key person that I dealt with on the external side, absolutely key person, key leader. Admiral Bill Rowden is another.

RC: How do you spell Rowden?

TC: R-O-W-D-E-N.

RC: Say a word or two about each of these.

TC: Well, Admiral Meyer was the Aegis program manager, among other things. Bill Rowden was COMNAVSEA.

RC: How would you characterize these guys?

TC: Leaders. They were leaders. They were visionaries. They had great principles. They were great communicators, and they helped shape where we were headed.

RC: I've seen a couple of interviews with Meyer. He seemed to be kind of a feisty character.

TC: That's an understatement. That's right.

RC: But people liked him for that.

TC: But because he was a principled person. He was very principled and he stuck to his principles, and people respected him for that. They still do, as they should. Was he easy to get along with? Not really, but you'd be amazed, when you got to know him, how easy he was to get along with. He's a wonderful guy. So those were two key ones that I knew of and that I dealt with in the . . .

RC: How about internally?

TC: Internally. Well, gee whiz, I hate to name names, because then I'll leave somebody out.

RC: There's a hundred people left out. Well, that's going to be a problem in the book, rather than for you, though.

TC: Yes, really big time, so I don't want to get into that. I would just say that the people that I had around me in my tenure as technical director, as department heads and program managers and division heads and others, that the management and technical structure was just fantastic. I mean, I had people who I trusted implicitly. These people took great risks, they took initiative, they were creative, and we left them alone, or tried to leave them alone as much as the law would allow, and they went off and did great things. That's the one thing I really . . .

RC: Now, you sort of inherited some of this.

TC: Not sort of; I did. And so credit goes to my predecessors.

RC: Was there something about the culture here that brought these people to the top?

TC: Well, no question. I mean, I'll give you two anecdotes. Dahlgren's philosophy and culture is very oriented toward delegation to the lowest level, giving people freedom to take risk and initiative, and rewarding it. And I have two examples with that maybe I'll end on this

note. The first was my education, like I told you at the beginning. Here I was, a naïve master's student, thinking that I could get help getting my education from an organization I'd never worked at. I didn't know any better. I was stupid. Well, it turns out that the people at Notre Dame apparently—well, there was a connection which I won't get into, but there was a connection between the people at Notre Dame and the people here, and my department head at Notre Dame and the technical director here had apparently—and unknownst to me, the department head at Notre Dame, the Aero Department head, who knew the TD here, Barney Smith, called him or said, "Hey, this guy Clare's a good guy. You might want to look at him."

RC: And who was that department head?

TC: John Nicolaides, N-I-C-O-L-A-I-D-E-S. I'm assuming. I don't know this, but I'm assuming he talked to Barney Smith.

RC: But you found out later they knew each other.

TC: They knew each other, so I'm assuming they talked to each other, because I cannot believe that they would just take this person out in the Middle West that they never heard of before and give him this deal. So, as I said, I wanted to continue my Ph.D., they had rules and regulations, they could not put a person on full-time study, in other words, as an

employee, pay their tuition and everything else on top of that, without having worked there. It was illegal. But they wanted me as an employee . . .

RC: That showed their flexibility.

TC: It showed their initiative and creativity. That's data point number one. The second, data point number two, is my first day on the job, after I got my Ph.D. It turns out that NAVAIR was interested in my dissertation topic. It had to do with missiles, rolling motion of missiles. And they had indicated an interest in funding it when I came to Dahlgren. So, of course, that was a big deal. Here I come, a new employee, working out of a Ph.D. and I'm ready to bring money in hand. I mean, that was a big deal.

RC: Pretty nice.

TC: So I didn't know all this at the time, I mean I didn't know how big of a deal it was, but I knew it was important, because they were going to fund me like $75,000 and, of course, this was 1970 . . .

RC: That was a lot of money then.

TC: Whew. My salary at the time was like $10,000, so I thought, "My god." It was like a fortune, not that I was going to get it, but it was just . . .

RC: You'd be able to spend it, though.

TC: Spend it on work and stuff. Well, it turns out that my first day on the job, on a Monday, I was told by my then-branch head to go to Main Navy—it was before Crystal City—and give this presentation. He gave me a room number and a building number and a phone number and a person's name and all that. I didn't know any of these people, of course. I'd been at graduate school. I was told to bring my slides, my viewgraphs . . .

RC: On this question of rolling motion of missiles.

TC: Yes. Right. So of course, I knew the topic, but again, a graduate student or a guy just getting his Ph.D. . . .

RC: You'd never given a briefing.

TC: I'd never been in Washington, for crying out loud, you know, much less given a briefing like that. So anyway, I walk into the building, Main Navy, I find my way there, and, again, I haven't even shown up here yet. Nine o'clock rolls around, I'm in this room, and in walks all these people, and I don't recognize anybody. My branch head wasn't there. Nobody was there from Dahlgren. He said, "Are you Dr. Clare?" I said, "Yes." He said, "Well, I'm so-and-so from NAVAIR, head of the Science and Technology Directorate." This was when the systems commands did have tech-based money, by the way. That was

one of the issues I mentioned earlier that was the problem in 1990. But they did have it at that time. And he says, "You're on. You've got forty-five minutes," or whatever it was. So I gave my presentation. I was sweating bullets, and I was very angry and very nervous.

RC: That you'd been left flying in the wind like that.

TC: Yes. So it turns out, it was over, they asked me some questions, and they said, "That's really good stuff. We're going to fund that."

RC: This was before you heard about the $75,000?

TC: Oh, no, no, no. I had been told in advance to go give this presentation because it potentially could bring some $75,000 to Dahlgren.

RC: Oh, and that's what did bring it.

TC: That's what brought it. They told me, at the end of the meeting, that this would, in fact, be funded. So then I had to get in my little car and drive down 301 to Dahlgren, go up and come in and start working. Well, I was so mad by the time I got there that—where the hell was everybody? So I go charging into my branch head's office—or division head, I don't remember—I said, "Where were you?" And they said, "Well, how did it go?"

And I said, "It went fine." They said, "Did you get the funding?" I said, "Yes." They said, "Well, congratulations. We knew you'd handle that." "What?" So my first day on the job, I was exposed . . .

RC: It came all the way down to you, in other words.

TC: I learned that from day one.

RC: You had to do the management, you had to do the fundraising, you had to do the presentation, and . . .

TC: I had total responsibility for it and that's the way they operated and they did it on purpose.

RC: That is a good anecdote, because it does illustrate this question of the delegation right down to the lowest level.

TC: Absolutely.

RC: And you hadn't even been here.

TC: I hadn't.

RC: So you couldn't be any lower, you might say.

TC: I was the lowest of the low. So when you say to me, "How could I give you some insight about the culture of Dahlgren," those are two anecdotes I told you. One, they took the initiative to hire me as a GS-9 and my position description, which I still have in the file, says to go to Notre Dame. And the second was this briefing.

RC: L.T.E. Thompson and Barney Smith both talked about the "Dahlgren way," earlier, thirty years earlier, and maybe that's what they were talking about.

TC: Maybe. I can't tell you what they were talking about. All I know is I felt it, twice. So that's what we got. So I need to run.

RC: You sure do.

TC: If need any more, give me a buzz.

[End of Interview]