

## 13 June 2000

**WINKLER:** This is Dave Winkler of the Naval Historical Foundation, with Admiral McKee here on the 13<sup>th</sup> of June for our third in a series of interviews. This is Tape 1, Side 1. Let's start out – you're at the Naval Academy; how did you wind up over at Third Fleet?

**McKEE:** My orders to THIRD Fleet came as a surprise. Admiral Holloway had asked me to stay at the Naval Academy for a four-year tour, but he was relieved near the end of my third year by Admiral Tom Hayward; another naval aviator. Admiral Hayward probably had decided that it was time for a naval aviator to be Superintendent. My predecessor as Superintendent was Bill Mack, a surface warfare flag officer. Before him had been Vice Admiral Jim Calvert, a submarine officer. An aviator had not had the job for some time.

The first I knew of my impending departure came when Jim Watkins (Chief of Naval Personnel) called to say that Rear Admiral Bill Lawrence would relieve me. He was a good choice. I asked Jim where I would go next. He said: "We don't know yet, but we'd like for you to leave this summer."

I was not by any means ready to leave. We had not had time to stabilize all of the initiatives we had put in place, but Betty Ann and I began making preparations to go somewhere. The first indication that I would become COMTHIRDFLT came not from the CNO or BuPers, but from someone in the CIA. We were given no time for leave between duty stations, but that was not unusual. I only was able to take more than a few days leave between duty stations once in my career – that was during the Cuban Missile Crisis. I was enroute from duty as XO NAUTILUS to XO SAM HOUSTON.

**WINKLER:** Departing the Academy – I assume this happened during the summer?

**McKEE:** It happened in midsummer. My early departure sort of scrambled things in the Naval Academy administration. My Commandant, Jim Winnefeld was already leaving. He had been selected for flag rank. Another aviator had been ordered in as Commandant, so I had brought in a non-Naval Academy submarine captain (Jack Darby) as the Deputy Commandant. I had thought it would be useful to have a non-Naval Academy officer in that position for a change to give us an outsider's view. He was an extraordinarily capable officer. Jack had served as my weapons officer in Dace. (He later was selected for flag rank and commanded the Pacific Submarine Force.)

When they asked me to leave early, BuPers had a naval aviator coming as the Superintendent with another naval aviator coming at the same time as Commandant. (No theological balance there.) Bill Lawrence had become impressed with Jack Darby, so he let it be known that he would be happy to have Jack stay on as Commandant until BuPers could get back into a normal rotation by appointing a surface or submarine officer to the job. That was done; so for that year, the Naval Academy had a graduate of the University

of Colorado as Commandant of Midshipmen. All concerned viewed Jack's tour as highly successful.

**WINKLER: So Jack Darby was the assistant under...**

**McKEE:** He had come as Deputy Commandant to serve under Jim Winnefeld.

So off we went to Hawaii. My son had graduated from the Naval Academy in '76, and was completing the nuclear power training pipeline. I took Betty Ann and our daughter Anne to Hawaii.

COMTHIRDFLT was not a job to which I had aspired. I was not pleased with the way my departure from the Naval Academy had been handled. As COMTHIRDFLT I would relieve VADM Sam Gravely – the Navy's first African-American three-star officer. He was a gentleman, and a very capable officer. He had been in the job for two, perhaps three years. It had been a busy time for him outside of his normal fleet commander's responsibilities; spending a fair amount of time on the road. I am told that he represented the Navy well, and that's what the Navy wanted him to do.

When I had relieved as COMTHIRDFLT, I encountered what I considered a rather strange arrangement. I had no control over the operating schedules for ships (and aircraft) that would serve in THIRD Fleet. Virtually all operational (as well as the usual administrative) responsibility resided with Type Commanders in San Diego. COMAIRPAC was very influential, as was COMSURFPAC. They had taken those responsibilities away from THIRD Fleet when COMFIRSTFLT was designated COMTHIRDFLT and moved from San Diego to Hawaii. (COMTHIRDFLT recently returned to San Diego as COMFIRSTFLT – as it should have been.)

I set out to recover at least some of those responsibilities, but that made for a difficult time. I was only there for a year.

Most of my time in the job was devoted to restoring COMTHIRDFLT's normal responsibilities as a fleet commander. I wanted to run the THIRD Fleet schedule, just as FIRST Fleet had done in San Diego before moving to Hawaii. When deploying Battle Group Commanders began working up for deployment to SEVENTH Fleet, I wanted them to follow my schedule and my policies, taking full responsibility for all aspects of their Battle Group. That meant ensuring that their forces were adequately fueled, maintained, armed, and manned as well as trained.

Not everyone was happy with what I wanted to do, but at least one of the Battle Group Commanders was. That Commander was RADM Bill Ramsey. He handled the situation very well and others followed his example. They also came to recognize the value of total responsibility for all of their units. Everything worked out well in the long run.

COMTHIRDFLT (C3F) was never able to conduct a major fleet exercise during the time I had the job. We planned one, and set it up, but Vice Admiral Ed Waller relieved me before it could be conducted.

In summary, COMTHIRDFLT was not a particularly enjoyable tour, but it was professionally rewarding because I was able to get a lot of the things that needed to be done in place before I left.

My orders back to OPNAV came as a bolt out of the blue, with no leave, and as things turned out, to a job that was not yet defined. I was going back to an existing billet (OP-095, the ASW Directorate), but one that was soon to become the Naval Warfare Directorate.

**WINKLER: Why do you think the move was made? In retrospect, do you think you were moved out of there because somebody saw you as the person to put in this new job?**

**McKEE:** I guess that was the way it turned out. But I had no inkling of that until some time later.

**WINKLER: A few follow-on questions. The responsibility for THIRD Fleet – I guess the demarcation line was what, at the International Date Line?**

**McKEE:** It was either the International Date Line or at longitude 165 East. I no longer remember which is correct.

**WINKLER: But you mentioned that you had responsibilities for some facilities down in Antarctica?**

**McKEE:** Yes - in Antarctica and in the Aleutians, but those responsibilities were administrative rather than operational.

**WINKLER: Did you have interactions with any of the South American countries?**

**McKEE:** No. We had occasional interaction with the Japanese when they came to Hawaii; and with the Canadians – whoever came into my area of operations. But they did not report to me.

**WINKLER: Of course, as THIRD Fleet commander you reported to CINCPACFLT.**

**McKEE:** Right.

**WINKLER: And then under you, you had the Battle Group commanders?**

**McKEE:** Yes. There were generally one or two in various stages of work-up for deployment.

**WINKLER:** Okay. Well then you discussed these new orders for something that you were not quite sure about.

**McKEE:** That I was totally ignorant is a better way to say it. I expected to go back to an OP-095 that was basically unchanged since it was founded by Admiral Martell. He had put that staff together years ago when Antisubmarine Warfare was in great difficulty. It was a fine organization. They had done a lot of good work. Vice Admiral Ed Waller (who lives right up the road from me now) left the OP-095 job to come out and relieve me. I went back to Washington and took his place.

After I reported to OPNAV, the CNO (Admiral Tom Hayward) asked me to reorganize OP-095 into the first stages of what is today the Naval Warfare Directorate.

**WINKLER:** N8.

**McKEE:** N8. I believe that is the right code. Basically what he asked me to do was to establish a three-star job that would be responsible for some of the work that had been done by the three previous three-star warfare directorates. What had been 05, 03, and 02 (three-star billets) would eventually become two-star jobs, as they are now. They would eventually report to me (or to my relief). You can imagine how popular that would be initially.

The CNO didn't give me a lot of direction as to how to go about putting this new organization in place. The only advice he offered was: "Don't make anybody mad." I set about doing that, and it worked out pretty well. I brought in a young commander (Bob Natter) who had been my Flag Secretary at the Naval Academy. (He is now CINCLANTFLT.) He became my Executive Assistant and Senior Aide.

**WINKLER:** You're talking about...

**McKEE:** Admiral Robert J. Natter.

We reorganized, and filled out the staff with officers from each warfare area: including the Marines. I wasn't in the job all that long. We were sort of half-way toward the CNO's goal by the time I left to relieve Admiral Rickover. OP-095 remained a three-star billet, but the title became "Director of Naval Warfare." The principal subordinate organizations on my staff were to be headed by Rear Admirals. Those included strike warfare, anti-air warfare, anti-submarine warfare, mine warfare, and amphibious warfare. We had analytical responsibility for each of these areas. We exercised those responsibilities for the first time during the budget cycle for Fiscal Year 1981. My tour in OP-095 lasted for a little over two years.

By the way, you asked how I came to be selected for the job? The CNO just told me to do it. I don't know any more than that.

We drafted a charter for the new organization; the CNO approved it and we began to organize and staff it accordingly. We basically had to bring in a number of new staff officers. The original OP-095 (ASW) had aviators, submariners and surface officers, but they were all basically ASW specialists. Now, as I said earlier, we had to bring in officers with much broader experience.

**WINKLER: Now, you still maintained the “barons”, OPs 02, 03, and 05. So for you to do your job, I assume you had to take some of the budgeting powers? Where was the give?**

**McKEE:** As I recall; it's foggy now.... You remember what 96 used to do for 090? Remember that? Or are you too young?

**WINKLER: I'm too young for that.**

**McKEE:** 090 was the planning and programming and budgeting office. That eventually changed after the Warfare Directorate was established. OP-96 had been 090's analytical arm, as was the Center for Naval Analyses. The Center for Naval Analyses has continued in operation. I believe OP-96 was still alive and well while I was in OP-095, but I don't remember for sure. The 090 organization had only a limited focus on technical and operational subjects. That changed in the new organization.

You asked about accomplishments. We defined the mission of the new organization and produced a charter. The CNO approved it, in spite of lively arguments from the “barons.” Initially, I was not all that enthusiastic about the idea either. It gave me a potentially powerful position, but I did not really like the concept. I'm still not sure I like the arrangement by which the three principal platform sponsor organizations are headed by two-star (rather than three-star) officers, but I reckon it fits well with contemporary enthusiasm for the concept of “jointness.”

Let me digress for a moment and talk about “jointness.” I'm a believer in reasonable parochialism. The current idea that everybody is expected to be completely non-parochial throughout their careers is destructive. All of the “giants” of our Navy's history grew up in an environment in which enthusiasm for their chosen warfare specialty was not unacceptable. We have yet to prove that what we have now works as well in the crucible of a major war. In our former philosophy, officers proved themselves qualified for flag rank in command at sea in their respective disciplines, and gained opportunities for higher authority by establishing a matchless service reputation. Today officers are required to dilute that operational experience by serving in at least one “joint” staff billet (e.g., the Joint Staff, the Defense Mapping Agency, etc.) even before or sometimes in place of major command at sea. The former total-immersion approach for young aviators, submariners, or surface officers (up to the point of command) is no longer a requirement. I don't believe any officer can get the same sense of himself (or herself) in

that circumstance. In fact, one of the pressures behind Title Four (Goldwater Nichols Act) was to eliminate that philosophy.

Under the provisions of Title IV, an officer may not be selected for flag rank unless he has served in a joint billet. So (as an example) a captain who has had a three-year tour in a “joint” billet as a lieutenant or lieutenant commander will eventually be in a better position to be selected for flag rank than an officer who did not have a joint tour but who commanded a Trident Submarine or a major Surface Warship; even a CVN. That is not right. While I was Director of Naval Reactors, I was able to get an exemption from that requirement for nuclear-trained officers.

Admiral Bruce DeMars continued to maintain that exemption after I left, but it has gone away now. It has become necessary to shorten tours in nuclear warships to accommodate the need for shore assignments in joint billets. The only current prerequisites for flag rank are service in a joint billet and of course, an outstanding service record. Successful command of a combatant ship is no longer a prerequisite. I digress, but I think it’s important to put all this in writing. I spent a lot of time trying to keep this situation from getting out of hand, at least in the Submarine Force.

You asked about my role in developing the “Maritime Strategy”: Jim Watkins was still CINCLANTFLT then, and John Lehman was Secretary of the Navy. The big push on the “Maritime Strategy” was just beginning (as I recall) as I left THIRD Fleet and settled into OP-095. Tom Hayward, Jim Watkins, and John Lehman were basically the architects and defenders of the “Maritime Strategy.” Admiral Hayward had gotten it off to a good start, but I was too busy in my new job to spend a lot of time with strategy. I was more involved in tactics and tactical tools; e.g., what was needed to implement the strategy.

**WINKLER: Is there a good case study of a program that you either initiated or fine tuned under your watch at Naval Warfare?**

**McKEE:** The conversion of OP-095 from its focus on anti-submarine warfare to the broader focus on all naval warfare areas would be a pretty good case study – if that is what you mean. I really didn’t have time to focus on one specific program. In fact, that really wasn’t my job (to be an advocate for a particular program). I think my tour in OP-095 can best be described as transitional but most of our basic principles are still in place. As I remember it, Tom Hayward’s estimate of how long it would take to get the new organization working the way he wanted it was about four years. In the end, it would go well beyond his tour.

**WINKLER: You mentioned the transitional period. That also was a transitional period in that the Reagan administration came in. Did you see any effects of that as Director of Naval Warfare? As far as increases in budget, and...**

**McKEE:** Yes. It rapidly became easier to make the case for what the Navy needed. Under President Carter, that was not the case. His administration did serious harm to the

fleet. They cut back on flying hours, operating time, spare parts, etc. We had to rob Peter to pay Paul in order to keep aircraft and ships operating. Neither ships or aircraft were in good shape. Submarines were better off than other warships, probably because of Rickover. He was a very strong and influential guy. His insistence that good material condition be maintained in the propulsion plant was also reflected in the rest of the nuclear ships. President Carter considered himself a former close associate of Admiral Rickover. He liked to describe himself as a former member of Rickover's staff.

**WINKLER: So with the new Secretary of the Navy it became easier to advocate...although during the last year of the Carter administration I think there was a change, given the global situation with Afghanistan, the Shah, that the spigot was loosening a little bit.**

**McKEE:** Yes it did. Somewhere I have an original MacNelly political cartoon, showing Mr. Carter wielding a giant samurai sword. The artist went on to explain how a humble peanut farmer from Georgia had discovered the art of war late in his political life.

Things were clearly improving. A 600-ship Navy became a goal in the Reagan Administration. We barely got to that level before things began to tighten up again, but it was a lot easier. That goal certainly helped me put the new organization together. I don't know whether it would have been even practical to try it under other circumstances.

**WINKLER: As far as your relationships, did you have any dealings with Congress in this job?**

**McKEE:** Very few. As I recall, we went through two budget cycles. I was down in the trenches most of the time. As I said earlier, the "barons" still had three stars and O90 was still in existence. Those entities remained as they were until some time after I left.

**WINKLER: So basically, as far as command relationships, you worked with OP 02, 03, and 05. In your day-to-day dealings, these were probably the organizations you worked most closely with?**

**McKEE:** Well, yes, but they didn't report to my organization. That came about after I left. I had elements of my organization that corresponded to areas for which they were responsible.

**WINKLER: Basically, the way I understand, you had, for example your anti-air warfare guy taking a look at the anti-air threat and taking a look at the air-to-air systems, the surface-to-air systems...**

**McKEE:** That's right.

**WINKLER: ...and evaluating which are the more effective means to defeat this threat.**

**McKEE:** Well, I'm not sure it was quite that simple. What we sought to do was to evaluate the best mix of capabilities. It wasn't a case of picking the single best, or one being better than the other in every situation. The question was, what's the best mix? The same philosophy applied to antisubmarine warfare, strike warfare and so forth.

**WINKLER:** Well, in antisubmarine warfare you're dealing with all three warfare areas.

**McKEE:** No really – we dealt with platforms and applications. Air, submarine, surface and shore activities (the SOSUS); a very broad spectrum of supporting entities. Intelligence was also a very important part of all that.

**WINKLER:** Any other things we should touch on during that two-year posting? I imagine your family is now following you out..well, you're actually graduating the kids.

**McKEE:** Yes, the kids were graduating. When we went to Hawaii, Anne, my youngest child, had finished high school and had a year of college. We had suggested that she go to Ann Arundel Junior College because I didn't want her to miss being part of our Naval Academy experience. When I had to leave a year early, it scrambled her program because that first year in junior college was not very effective and there would be no second year there for her unless we left her behind. She went to Hawaii with us, and attended the University of Hawaii, then on to other colleges when we returned. Jim was more fortunate. He attended one high school (Episcopal High School in Alexandria) and one college (the Naval Academy).

**WINKLER:** Now it comes to the point where...the next job.

**McKEE:** The NR job.

**WINKLER:** And in your article...you kind of go to the third person..."I was told I'd be the next..." Who told you? My understanding, reading Lehman's book, is that he's the one pulling the strings as far as Rickover's removal.

**McKEE:** I don't have a lot of specific information about John's role. He was certainly a player in the exercise. The article you refer to is one I wrote it with Tim Foster (who had been on my NR staff). He had been with Rickover for over twenty years. (It might be worthwhile to include that article as an appendix to this oral history.)

**WINKLER:** Sure. What we're referring to, for the record, is the article "Relieving Admiral Rickover" in the April edition, 2000, of "Shipmate" magazine, the alumni association magazine.

**McKEE:** That article describes events as they occurred. It all began (for me) in December of 1981. I was attending a luncheon hosted by a civilian employee of the



Navy for me and for the VCNO (Admiral Bill Small). During lunch, I received a phone call from Jim Watkins. (Jim was CINCPACFLT by that time, soon to be CNO.)

The principal players in the process were Watkins, Lehman, and Weinberger. I don't really know who made the decision. The article says, "the administration decided." If you read Lehman's book, he decided. I don't think Mr. Weinberger has ever said whether he initiated the drill or not.

Once the decision was made, Admiral Rickover's former deputy (Bill Wegner) played a quiet, but critically important role. He had retired from Government service several years before.

Bill Wegner was well known and highly regarded. He is technically competent and politically astute. He knew how to deal with Admiral Rickover better than most. He had not lost contact with him. There was also the Secretary of Energy to consider. Admiral Rickover had responsibilities in that organization as well as in the Navy. The Secretary of Energy as well as the Secretary of Defense had to approve whoever would be appointed to relieve the Admiral. Also, neither of them could fire an incumbent Director without the agreement of the other. It was a rather complicated situation.

**WINKLER: Rickover designed it that way.**

**McKEE:** Well, there was nothing in writing at the time. The rules had just evolved. I'm not sure Admiral Rickover ever tried to articulate them. The only NR organization chart I know of was written in Chinese! I helped put in writing what was already in place before I accepted the job, and we obtained the Executive Order just before I relieved. It carefully reflected exactly what was in practice at that time. It did not attempt to reach into the future. Do you have a copy?

**WINKLER: Not with me.**

**McKEE:** Let me give you one. You may wish to attach it to this document. I will also provide language from Public Law 98-525; under which the order became law.

But back to the sequence: I got the phone call I mentioned earlier. I was told that Admiral Rickover was going to retire and that I should plan to relieve him. I was not surprised. In fact, years earlier, some of my midshipmen had been telling me that I would end up in that role. (I always listened to the midshipmen. They may have it right for the wrong reasons, but they often seem to be right.)

I was not the only officer to be considered. One other vice admiral wanted the job. I believe that Rickover had initially agreed for me to take the job, but as soon as it was announced that I would be his relief, he may have decided that I had been part of a "cabal" that was trying to send him into retirement.

There was a lot of discussion about how to effect the relief. The administration's eagerness to have the relief go off smoothly helped me set things up so I could manage the process (and the job) to best advantage. For example, John Lehman initially suggested that I go to NR as Admiral Rickover's Deputy for six months to learn the job.

I told him: "That won't work. The landscape is littered with heirs apparent to senior jobs, in industry, in the Navy, anywhere you want to go. And I know Admiral Rickover well enough to know that is true. The thing for me to do is go over there and relieve him as quickly as possible." John agreed.

At that time I also said one of the things we must do is make sure that the NR organization holds together after the transition. That meant we needed a clear focus on what might come next. NR had not designed a new attack submarine propulsion plant since 1964. The Russians were creeping up on us and we were still trying to get as much as we could out of 688 class. That ship was still a fine submarine but it would not last forever. There was work we ought to be doing in that regard, as well as in a number of other important areas.

John Lehman agreed. He went on to support the design that became Seawolf (SSN 21) as well as a number of other initiatives that would require Navy resources.

(END OF SIDE A, TAPE 1)

**WINKLER: Tape 1, Side 2 here on the thirteenth of June.**

**McKEE:** It is not easy to start any major new program, particularly a new SSN. You're familiar with the rather ponderous process that we have to go through. My principal responsibility for Seawolf was the propulsion plant (everything aft of the forward reactor compartment bulkhead), but I also was involved with defining some of the tactical capabilities that were included in the design of the ship. I had several strong opinions as to what was needed. The submarine community was basically in agreement with what I proposed.

In the final analysis, I did not play a direct role in the detailed design of the tactical systems, but I had a lot to do with concepts and fundamental principles that went into that area, e.g., battle damage resilience, better weapons handling, and greater weapons storage, etc. – we'll talk more about that later.

John Lehman agreed with our recommended propulsion plant characteristics, and we went forward. We got a head start on the propulsion plant design, because it was done primarily with Department of Energy resources and the approval process in DOE was not as ponderous as in DOD. I also had John Lehman's agreement to go ahead, as well as that of the Secretary of Energy.

We needed to get a head start. The fact that we were able to do so upset a few folks in the Navy Secretariat and in DOD, but we were able to continue.

One of my greatest concerns in undertaking to relieve Admiral Rickover was that key members of his staff might leave because of what they perceived as the high handed way in which his departure was handled. Conventional wisdom had predicted that if he were forced out of office, a lot of his senior people would walk away. He had an extraordinarily talented and experienced staff, most of whom had continued to serve well beyond the minimum times (either on active duty or in civil service) primarily out of loyalty to him and commitment to the job. None were adequately compensated for what they did, and they didn't have to stay. One of my senior section heads was solicited by a British industrial firm while I was there. They offered to start him at over \$300,000 per year to come to the U.K. and work in their nuclear propulsion program. He stayed at NR. That could have been a fragile situation. The key was that our principal players had quickly come to believe that fundamental NR principles would not change when I relieved the admiral. They recognized that details would have to change, because I'm a different guy – but the fundamentals upon which the program was established and proved successful had to remain in place. Anything short of that could have planted the seeds of serious problems.

One other event that occurred right after I relieved was interesting. An old Rickover hand (who had been retired for some time) approached the Secretary of Energy with a proposal. (The Secretary had no technical background.) That proposal was to establish a group of advisors (to whom I would report) with himself as chairman. They would oversee our work. The Secretary of Energy told me of the proposal and asked what I thought. I said that it was unacceptable. He acknowledged his lack of technical background and said he just needed a way to have confidence in what we were doing.

I told him that if he did not have confidence in me he should find another officer to do the job. It was that simple. This was not a job that I wanted to be involved with without the independence and authority to do it the way I knew it had to be done. NR is unlike any other job in the Navy. Relieving any other four-star officer is a pretty straightforward process. This was unique. It was then and it still is.

I mentioned the Presidential Directive earlier. I had SECNAV agreement that it would be in law before I relieved (rather than a Presidential Directive). But the clock was running, we were at the end of the authorization and appropriation cycle, so it went forward as a Presidential Directive. It did so quietly, because there was some serious industrial opposition to a formal definition of NR's responsibilities and authority as they had existed. Neither of our nuclear shipbuilders wanted to see these rules codified in law. They had seen Rickover's departure as an opportunity for the organization to become more like the rest of the Navy.

**WINKLER: For context, there had been some problems with some of the shipbuilding industries and Admiral Rickover.**

**McKEE:** Yes.

**WINKLER:** And I guess there were some claims problems.

**McKEE:** Those are briefly described in the “Shipmate” article.

**WINKLER:** That’s right.

**McKEE:** Admiral Rickover had been fighting a battle (with Electric Boat in particular but Newport News as well) over claims. He described them as fraudulent. They were at least spurious. As they saw it, the deal was to work on the ship, then when it was ready to be delivered, put in claims for cost overruns. They would not deliver unless the Navy paid all claims. Rickover would not stand for that. Things became very bitter. Those companies had brought pressure on various administrations to do something about Rickover. I mentioned that rather gently in my article, but there wasn’t any question that it had happened.

A decision was made to put our charter into law quietly and quickly, so it was added as an amendment to another, completely unrelated bill.

**WINKLER:** The German Art Bill?

**McKEE:** The German Art Bill that was going through the congressional approval process at the time. (I believe the German Art Bill was intended to return captured German war art. It included several works of submarine art that had been seized after WW II.) It was all supposed to be done quietly. That effort failed because lobbyists for some defense related companies worked hard against it.

After the amendment failed, John Lehman called to tell me he had not been able to get the directive into law, but he offered to ask President Reagan to sign it as an executive order.

I told him that would be okay, as long as I had his agreement that we could continue working to get it into law. He posed no objection

In retrospect, he probably didn’t think we could do it. It had been shot down once, and it would probably get shot down again. However, we got it done in the following budget cycle. He was surprised. I think he had forgotten that he told me it was okay to go ahead.

The charter has been in law and working well for almost 20 years. The existence of the law has been critically important. It has carried the program through periods of mischief that sometimes accompany changes in administration. Political appointees in the Clinton administration sought to alter elements of the Naval Reactors program shortly after they came to office, but they ran up against the law.

**WINKLER:** That's very important, to discuss how this came about. And then, of course, the article discusses the turnover process, which was, basically, Rickover left you alone.

**McKEE:** That's correct, but somewhat over simplified.

**WINKLER:** NR had twenty-two different directorates?

**McKEE:** Right. We called them Section Heads. Admiral Rickover was not fond of management fads. Neither am I. The idea that a CEO (or his USN equivalent) has to be alone at the apex of his organization is nuts. If the Boss does not talk to the people to whom he has given specific major responsibilities (and do it frequently), they will never have an adequate sense of those responsibilities, and the Boss won't know what is going on.

Rickover organized the place and I left it alone. There were over fifty people with direct access to me, just as in his time. The twenty-two who were Section Heads in the Washington staff included metallurgy, resources, reactor design, program managers for surface ships and submarines, the shipyards, refueling, and so forth. By the way, here is one more paper that you might be interested in. This is a bio I put together when I retired. It attempts to explain to my new civilian associates what I had done in the Navy. That might be useful to you.

**WINKLER:** That's...

**McKEE:** I just gave you a bio earlier. This is a more detailed one.

**WINKLER:** Okay. This is a little bit more detailed.

**McKEE:** Right.

**WINKLER:** The question I had is, you have two hats: the Department of Energy and the... You have a Navy hat and you have a Department of Energy hat. Could you give a little background, explain how that worked for you?

**McKEE:** It worked well, because most of my research and development, a significant part of my funds for selection and training, a substantial amount of the funding I used to support the staff and the technical reps in shipyards and other industrial activities was provided by DOE. I had a lot more flexibility with that arrangement than people who were trying to work solely through the Navy and DOD systems. I could also move more quickly. We had long lead equipment on order for the new submarine early in the development process.

**WINKLER:** So your philosophy was basically, minimize the change. Yet you did have this initiative of designing a new propulsion plant.

**McKEE:** We did not “minimize the changes” at all. You need to get that straight. What I’m talking about is this. We didn’t change the basic principles under which the organization works, but the way we worked on a day-to-day basis evolved to fit my way of doing business, not Admiral Rickover’s. The fundamentals remained in place.

**WINKLER:** I guess the essence of the question is, how was your way of doing business different than Rickover’s?

**McKEE:** It had to do more with personality and background than anything else. For example, one of my responsibilities involved interviewing officer candidates for the program. Admiral Rickover’s interviews are legendary. Mine were just as tough, but they weren’t as harsh.

I think one of the principal differences between us was that I was an experienced submarine operator, with extensive experience at sea in difficult, sometimes dangerous operations, and with a fair reputation in command of Dace. I had a better sense of operational requirements. The NR staff members who had the best sense of operations and tactics were submarine officers in what was called the “Line Locker.” That is where I served on my first tour in Naval Reactors; among line officers attached to the staff to help with selection and training, but also available to offer advice on things operational.

In the case of Seawolf, I was able to play a role in establishing military requirements for the submarine as a whole, as well as the propulsion plant. I had definite ideas about what should be done and how to do it. Many of those ideas were incorporated in the ship. Battle damage resilience is an example. I had a sense that this class of ships should be made far more rugged and easier to control under adverse conditions than their predecessors. We set that as one of the principal goals for this ship. What would be learned in doing that would enable others to do the same in other submarines.

One of the arguments that we made over and over again in support of Seawolf tactical characteristics had to do with mobility. With the advent of nuclear propulsion our attack submarines had gained virtually unlimited endurance, but they did not have sufficient tactical mobility right away. Some would argue that. “What do you mean they don’t have mobility? The ship can run almost indefinitely at thirty knots.” Well, tactical mobility in a submarine is defined by quiet speed. Nautilus had great endurance, but very little tactical mobility because above six knots it was noisy, as was Skipjack. That situation existed until sound-quieted attack submarines (594’s, 637’s, and 688’s) went to sea.

Submarine force levels are not just a matter of numbers. They are also a function of what you can do with the submarines. If they have to creep across the ocean to get on station without being detected, it may take four or five times as many submarines to conduct the same combat operations as would be needed if they can run at twenty-five knots or better without being detected. By that definition, existing SSN’s did not have adequate mobility. That characteristic had improved with each new class but the curve of

radiated noise versus speed was still not flat enough. We made a commitment to fix that in Seawolf and the SSN's that would follow.

That commitment had serious implications for propulsion plant design, but it had implications for other things too. For example, if the ship is going to run at high speed for long periods of time we had to worry about controllability. One of the most dangerous things that can happen in a high-performance submarine is loss of stern plane control at high speed. In that circumstance, the ship could have less than thirty seconds to recover before exceeding crush depth. That concern was resolved in Seawolf with a new design concept for the stern planes; one that will be in all ships that follow. Seawolf conducted stern plane failure trials at flank speed (flank speed in Seawolf is faster than any other submarine operating today) and the depth excursion was only about 150 feet.

**WINKLER: Yes, as far as your emphasis on innovations.**

**McKEE:** That was one example of the innovations in this ship. (It was not an NR innovation.) Another was in the weapons systems. At the time Seawolf was being designed, we were still worried about a possible conflict with the Soviets. It's a long way up to the Barents Sea and a long way back. The only time a fast, quiet nuclear submarine is really vulnerable is in transit. If it carries only twenty or so weapons it could disarm itself in the first week or two on station then have to go all the way back to a support facility (probably at home) to reload, then come all the way back, again against determined opposition. We more than doubled the load, so this ship would not have to disarm first week on station.

The weapons load is a principal reason that Seawolf is as big as it is. Some "experts" have said it is big because we put a big power plant in it. Most such "experts" are unhampered by any experience or competence in our discipline. Seawolf is big enough to carry and shoot weapons that are available now and in the future. With a lesser weapons load we could have made the submarine substantially smaller. A submarine is a blimp, and less payload means less hull volume.

We also put larger diameter torpedo tubes in the boat. The Defense Science Board has repeatedly referred to "the tyranny of the 21-inch torpedo tube." We doubled the tube volume so that it would be possible to develop supersonic cruise missiles for submarines. The tube diameter is only about 30% greater.

Meanwhile, NR had to make sure that the propulsion system could support that kind of load and could still move the boat at a high quiet speed. We were also working on a life-of-the-ship core. This would be the first submarine that would be able to go for the life of the ship without having to replace the core.

**WINKLER: Do they have to do that with the Tridents?**

**McKEE:** Yes. They have to refuel.

**WINKLER: At the time, you were thinking mostly torpedoes because you were thinking of the Soviet threat. But Tomahawks are also part of the consideration?**

**McKEE:** Of course. One question that had to be addressed was whether or not to put vertical weapons launch tubes in the boat. The answer lay in the need for flexibility. Tomahawk is a torpedo tube launched weapon. With eight big horizontal tubes instead of four 21” tubes, it would be possible to load the whole torpedo room with torpedoes, or Tomahawk missiles or with whatever mix might fit the tactical requirement. Vertical tubes cannot handle torpedoes or mines.

Speaking of weapons load, there are also submarine laid mines to consider. Seawolf carries enough mines to close an important harbor covertly and all by itself. Fifty torpedoes, fifty Tomahawks, one hundred mines, or any kind of mix. We wanted that flexibility, and accepted the fact that the rate of fire for cruise missiles might be somewhat less than with vertical tubes. That’s okay - the rate of fire tends not to be as critical for a submarine as for a surface ship.

**WINKLER: At the time you were looking of course at the Soviet threat and the Soviets had developed this bastion strategy. I assume that strategy affected your considerations.**

**McKEE:** Sure it did. We were much concerned with forward deployment. A submarine is the only warship that can operate alone, outnumbered, and unsupported in waters completely controlled by the enemy. I used to tell the PCO’s (Prospective CO’s): “If you get on station and you aren’t outnumbered you’re in the wrong place.” No other naval forces can do that, but it is a requirement for submarines.

**WINKLER: The infrastructure for Naval Reactors – it mentions you have two dedicated contractor-operated government laboratories, two engineering procurement activities, eight shipyards, an expended core facility. This infrastructure – were there any changes, additions or deletions, made during your watch?**

**McKEE:** All that stayed about the same. We had two vendors for most of our principal equipment, two submarine shipbuilders, but only one shipbuilder for the CVN’s. We had two core manufacturers, but one did most of the work. The advanced core for Seawolf required an entirely different construction process. Most of the detailed design work for that core, and the first product, came from an existing industrial facility in Lynchburg, VA. Another facility, in Connecticut, was coming on the line for the new design when I retired.

There was one basic weakness in our industrial organization. We had only one fuel factory. There’s a difference between a fuel factory and a core facility. A fuel factory manufactures the fuel in a proper configuration for the core design. There was only one place in the country that could make our fuel. It was a commercial activity in



Tennessee. They had been doing it for years. They did a good job, but it was a fragile situation. It was also a cost-plus fixed fee operation.

There was more than one attempt by other commercial interests to acquire the fuel facility. We didn't want that to happen, but our principal concern was that we only had a single source. If anything went wrong in that place we might be in trouble.

Admiral Rickover had become tired of that situation. Shortly before he retired, the Admiral obtained funding to build a contractor operated government owned fuel facility, so we would have an alternative source. It was built, tuned up, and tested during my watch. It qualified to produce fuel just before I turned the job over to Admiral Bruce DeMars, but it never really got into operation. The Cold War ended; budgets were cut back severely; and the plant was mothballed.

**WINKLER: I think one of the challenges in maintaining your industrial base...you gave an example as far as the fuel facility. What other concerns did you have...? The question I have is, obviously there was some bad blood between Rickover and Newport News and Electric Boat. How was your relationship with these different CEO's?**

**McKEE:** We developed a useful relationship with both. We gave the Seawolf propulsion plant design responsibility to Bettis and to the Electric Boat Co. Mr. Tovar was the General Manager at EB. He was a good man to work with. It was not that we didn't have disagreements, but we encountered very few of the problems that had existed in the past. Newport News was not easy to work with, but we got along okay. They had the lead in designing the forward part of Seawolf.

One of our concerns with Newport News was their submarine overhaul work. (That had little to do with Seawolf.) It was taking too long to get our SSBN's out of overhaul. That had become a bone of contention. But they built good ships, and our concern with overruns and claims, began to fade away.

**WINKLER: Newport News also built aircraft carriers. During your tenure there was always at least one Nimitz-class under construction. Maybe one or two were put into commission during that time period. How much focus did the surface propulsion plants have within Naval Reactors?**

**McKEE:** There was no difference in emphasis between surface ships and submarines as far as NR was concerned. Naval Reactors designed the whole propulsion plant – reactor (primary) and engine rooms - for all nuclear powered warships (first of each class). In follow ships, NR was not responsible for the secondary plants but did maintain responsibility for the primary plants. It worked that way for the surface ships as well as submarines. We provided the same level of support for the surface ships as for the submarines.

We also explored new concepts. NR did some conceptual design work on a new surface ship propulsion system, but the Navy was not interested. Over time, there have been some who have grumbled that Naval Reactors was unable or unwilling to undertake any new concepts. This surface ship plant was unusual, to say the least. It was a combination gas turbine and nuclear propulsion system that could cruise at about twenty-five knots on the nuclear plant and could kick up to about thirty-five with the gas turbine plants. It might have been a very useful ship, but the surface Navy was not interested. There is a model of the ship in the Naval Reactors offices, but that's about as far as we got.

**WINKLER: Let's see, I was going to follow on with the relationships up there on the Hill.**

**McKEE:** NR's relationships on the Hill continued to be quite good. I testified before several subcommittees every year. We had solid support from both sides of the aisle in the Senate, right from the beginning, with Henry Jackson on the Democratic side and John Warner on the Republican side. We also enjoyed solid support in the House. The Nuclear Propulsion Program has always enjoyed strong support on the Hill, and it continued after Admiral Rickover retired. We had occasional difficulty with one or two staffers who seemed to have their own agendas, but that was not unusual. Members rarely reduced our budgets. They usually inquired as to whether or not we had asked for enough money to do what we had set out to do. I do not recall ever being told that we were asking for too much.

We did get into some pretty lively arguments on the Hill during authorization and appropriation hearings for Seawolf, primarily because of one staffer, who was much given to argument. In the beginning, he argued that Seawolf was going to be too capable for the threat it would have to face. As we approached completion of detailed design, he began to argue for delays, saying Seawolf was not capable enough. This individual was bright, competent, and very influential, but misguided when it came to submarine design. The boat was authorized and appropriated in spite of his opposition.

**WINKLER: You mentioned before Secretary of the Navy Lehman. After Lehman I guess you had Webb and when you left who was Secretary of the Navy? Ball, then Garrett.**

**McKEE:** Ball was the last one, as I recall. Webb wasn't there for a long time.

**WINKLER: No, he punched out in protest.**

**McKEE:** That's what I hear.

**WINKLER: But you indicated that you seemed to have a very good working relationship with Secretary Lehman.**

**McKEE:** Yes I did. Our relationship with Secretary Webb was okay, but he was not fond of submarines or submarine officers. I think his soul was scarred by having to study engineering at the Naval Academy. He could not seem to understand why a “warrior” had to know anything about engineering. He came from a different world and a different philosophy. At some point, he seems to have concluded that nuclear-trained submariners were good engineers but tactical incompetents. As he saw it, we didn’t care much about tactics or strategy – we just wanted to know what made the propeller go around. He apparently saw us as selected by Admiral Rickover only because we understood machinery. Some of his books involving the Naval Academy would lead the reader to that conclusion. Some of that went away after he became SECNAV and began to see reports of submarine special operations. I never heard him admit that those perceptions were wrong, but they appeared to diminish. That was about as much as we could hope for.

**WINKLER:** Well, he always saw himself as a war-fighter. He’s got that Marine Corps background.

**McKEE:** Sure. We sort of saw ourselves as war-fighters; a different kind of war, in a different environment – but still war-fighters.

**WINKLER:** One thing which was a challenge. I served in a tour of recruiting. Our office sent NUPOC candidates up to your office for interview and I remember pacing back and forth worrying whether or not you would give us a thumbs-up or a thumbs-down. That was one of the innovative programs, I think, that attracted quality people into the program. Was that a challenge for you, to keep that flow of top-notch people coming in?

**McKEE:** NUPOC was a great program. Recruiting is always a challenge because all the warfare specialties compete for the best guys. We got good people from all sources: the Naval Academy, NROTC, OCS, NUPOC, and NESEP. We didn’t get a lot of people from the NUPOC program, but those we did take were very good.

**WINKLER:** The OCS classes?

**McKEE:** Most were Liberal Arts graduates. Only about ten percent of each class had the minimum academic requirements for our program. Nevertheless, some very successful submarine officers came from that source and from other than engineering disciplines. One member of my nuclear power school class, Warren Kelly, was a History major from Brown University. He had never ever had basic calculus. Another was Pat Garner, a psychology major from Vanderbilt. He was in the same situation. Both graduated and became very successful nuclear submarine officers. Pat’s time was cut short when he went down with Thresher, but Warren Kelly went on to command an SSBN. In the final analysis, we were able to do very well in recruiting; enlisted men as well as officers.

**WINKLER:** Well, that's the other challenge, making sure that you have top quality enlisted. Doing these round tables with the chiefs of the boat up in New London and Kings Bay, the thing which we talk to these folks, what attracted them to the program? I think the mystique and the high tech was the thing that seemed to appeal to them.

**McKEE:** Those were important factors, but the attraction of a small crew of very bright, committed people was also important. Serving in a small ship has always appealed to bright young people who prefer less regimentation. Life on a submarine is strictly disciplined but it is not regimented. There is a difference.

**WINKLER:** Mentioning external relations, did you have many dealings with the media?

**McKEE:** Not a lot. I was never a believer in using the media to tell folks what a "good job" we were doing, or worse, to tell them what a "good job we were going to do." But, in general, we did just fine. The only times we got into any significant discussion with the media were on rare occasions with regard to port visits by nuclear ships. Those were handled carefully and successfully. We made a point of not going into heavily populated busy ports. For example, when the Navy began naming submarines for cities, SECNAV decided it would be a good idea to take each new ship into the city for which it was named for its commissioning ceremony. It would be good for the Navy, good for the ship, and good for the city. He was absolutely right about that, but it just didn't make sense to take a nuclear warship into a large city just for public relations purposes. (Though it had been done early in the program, e.g., Nautilus to New York after the first polar crossing.)

We basically kept a low profile. (The silent service, you know.) We did not have a PR staff, but we did have good guys who knew the players. We were always prepared to talk to the media but we did not seek publicity.

**WINKLER:** In retrospect, after the fall of the Soviet Union, one of the arguments about the silent service is that that might have hurt it some in the budget battles.

**McKEE:** There is no question of that. Very few people knew what we had done during the Cold War. Very few know much about that even today. A recent book ("Blind Man's Bluff") opened the door a bit. Not many of us wanted to see that book published, but it proved helpful because people began to have some understanding that we weren't just out there boring holes in the ocean. (The title of that book came out of a conversation I had with one of the authors.)

**WINKLER:** Following on with the port clearance. I had reserve duty in N3/N5 working with an officer whose responsibility was working the port clearance issue. During your tenure, did we get the clearance to go through the Suez during that time?

**McKEE:** Yes. I don't remember when the first port clearance was granted.

(END OF SIDE B, TAPE 1)

**WINKLER:** ...June 13. This is Dave Winkler with Admiral McKee. This is Tape 2, Side 1. Continuing along, we were talking about the port clearance issue. I guess New Zealand hadn't occurred yet, that was after your watch.

**McKEE:** I don't remember any difficulty with New Zealand while I had the NR job, but our ships did not go there often.

**WINKLER:** Okay. I was slipped a few questions asking about propulsion.

**McKEE:** I see them.

**WINKLER:** The first question – I was looking at your speech for the Development Group's 50<sup>th</sup> Anniversary and you were talking about Fat Albert.

**McKEE:** "Fat Albert" was a name taken from a Bill Cosby recording. It was used to describe an SSN, designed to satisfy people in DOD (and Navy) who had no experience or basic competence in submarine design. It was an effort to build a small, light, cheap nuclear submarine. It was called "Fat Albert" because it was fat and slow. It was to be a competitor to the 688's, which were lean, fast, and expensive.

Just being fat is not a bad thing for a submarine. A seven-to-one ratio describes the optimum hull for submerged operation, but it's hard to achieve unless the submarine is rather small. The Skipjack hull was about 8:1. Albacore was probably the only ship that had the optimum shape. But both of those ships were fast; "Fat Albert" would have been slow by comparison.

**WINKLER:** Seven-to-one ratio refers to?

**McKEE:** Length to beam. That's an optimum hydrodynamic shape. "Fat Albert" was the product of an abortive attempt to convince submariners that they should settle for a cheaper, less capable submarine at a time when the opposition was going in the other direction.

**WINKLER:** "Fat Albert" was kind of like the surface version of, let's have a small aircraft carrier and...?

**McKEE:** The Sea control ship.

**WINKLER:** Sea control ship. I was wondering about that reference to "Fat Albert" because... Now, were there considerations as far as propulsion plants for the new submarine? The SSN 21?

**McKee:** Of course. We wanted substantially greater power density, better quieting, and more battle damage resilience. We elected to stay with a pressurized water reactor, drawing on low flow experience gained in the Trident plants. Liquid metals (Lead-Bismuth or Sodium) were considered but not used for this Seawolf, although the first nuclear Seawolf did have a liquid sodium plant.

There are advantages to liquid metal; the principal one being higher thermal efficiency, but there are also serious disadvantages. If the plant sustains damage that results in primary coolant leakage, it cannot be repaired at sea. If it leaks uncontrollably, the radiation could kill everybody in the boat.

The Soviets built an Alfa class with lead-bismuth propulsion plants. They were very fast and very noisy. Our program took a lot of flack from “experts” and an occasional congressional staffer, who described NR as recalcitrant because we would not follow suit. Admiral Rickover did put a Sodium plant in the first nuclear Seawolf, then later replaced it with a light water plant.

The Soviets built six (or eight) Alfa's. They were never able to refuel them, presumably because of radiation problems. Alfa's were also very expensive – Titanium hulls, Lead Bismuth, etc. Russian sailors called the boat “the golden fish.” Pound for pound it was the most expensive warship in the world. That kind of cost would be a problem for us. Radiation in a light water plant will decay off in about twenty minutes, so the crew has a reasonable chance of sufficient access to fix a leak in the event of battle damage. Also, primary coolant make-up is important. We can make pure make-up water from the sea. We can't make liquid metal anywhere except in specialized facilities ashore.

A number of other factors went into our decision to use a pressurized water plant in Seawolf. It can be significantly simpler. Seawolf's power density is almost as good as a liquid metal plant, but without the radiation concerns.

There were always advocates for what we were not not doing. Admiral Rickover used to refer to their products as “paper reactors.” He wrote about that in a technical journal. His paper described his differences between “new” reactor concepts (“paper reactors”) and real reactor plants. He noted that a paper reactor generally has the following characteristics:

- It is simple.
- It is small.
- It is cheap.
- It is lightweight.
- It can be built very quickly.
- Very little development is required: it will use off-the-shelf components.
- It is in the study phase; it is not being built now.

By contrast, a real reactor has the following characteristics:

- It is complicated.
- It is large.
- It is heavy.
- It is being built now.
- It is behind schedule.
- It requires an immense amount of development on apparently trivial items.
- It takes a long time to build because of its engineering development problems.

Pressured Water Plants are also easier to operate and control. For example, liquid metal reactors usually do not have a negative temperature coefficient. Do you know what I mean by that?

**WINKLER: No.**

**McKEE:** In the light water naval reactor, we don't have to move control rods to control power (once the plant is critical and at temperature). The control rods are used to take the plant critical, then adjust for burn-up of poisons, temperature variations, etc. In a naval pressurized water reactor you can open the throttle as fast as you can spin the throttle and the reactor will instinctively seek to raise power to increase steam flow without rod motion. Close the throttle and the reactor reduces power without rod motion. It is fundamentally a very stable, simple plant. That's important, particularly when one considers combat maneuvering and battle damage. Why go in harm's way with a plant that is complicated, difficult to control and highly radioactive when there is clearly a better alternative.

In peacetime many naval officers and virtually all of our civilian masters tend to lose sight of the importance of damage control. I used to discuss that issue with midshipmen at the Naval Academy from time to time. Some of them did not even understand the need for the engineering competence that must enable effective damage control. After all, they were going to be "warriors." In their view a "warrior" does not have to know anything about engineering or damage control. They say, "I don't need to learn that engineering stuff because I'm going to be a weapons guy," or "I'll have people who understand that engineering stuff." I often got into discussions with such individuals at our receptions for upper class midshipmen. They would say, "We waste too much time with this engineering. We ought to be into philosophy, English literature and history, and so forth."

I said, "Okay. You're going to be Commanding Officers some day. And you're going to take your ships in harm's way, right?"

"Yes, sir."

“And if it gets to be a real dust-up, you may sustain serious battle damage; or at least some degree of battle damage. You will quickly be faced with the most important decision of your career, perhaps of your lives. You will have to decide whether you can control the damage and remain engaged, control the damage but withdraw, or you must abandon ship. You don’t understand engineering, but your plant may be seriously damaged – so who will make that decision?”

“Well, I will.”

“Okay. That’s your job. But you won’t know anything about the engineering plant that makes the ship move, makes the weapons shoot, the sensors function. There is no need; after all, since you are a “warrior.” How are you going to shoot if you haven’t got any electricity?”

“Well, I’ll get the engineer.”

I said, “Okay, so you’re the Commanding Officer and you’re going to put the lives of everybody in your ship in the hands of the Engineer Officer; probably a new lieutenant. You want him to make that decision for you. Is that your plan?” Well, that was their plan – and for some of them it still may be – but it is wrong!

The CO has to know whether or not he can play hurt! Safety at sea, in peace or war, and nuclear safety in particular, has a lot to do with engineering competence. Without that, your ability to operate under unusual conditions will always be marginal at best.

**WINKLER: The Soviets, they always double-hulled a lot of their submarines. That’s something that we do not pursue.**

**McKEE:** Remember, a submarine is a blimp. A double hull adds . It takes a lot more volume to hold that weight up when submerged, and submarine becomes bigger and less agile. Designers concluded that a single hull was a necessary trade-off in the initial design of Albacore.

**WINKLER: Was there any consideration for building diesel boats while you were at NR?**

**McKEE:** No. Various “experts” (Norman Polmar is an example) have repeatedly urged the Navy to build Diesel boats, but it doesn’t make sense for us to do so. Most of the places where our submarines will need to go are a long way away. Our SSN’s can get there at over twenty knots. The best a Diesel boat will be able to do is about twelve to fifteen knots on the surface and five or six submerged for short periods. The tactical situation would probably be overtaken by events before a Diesel boat could arrive. Some smaller countries use them because most problems they envision are likely to occur in their backyard. But that kind of thinking does not suit our situation.



**WINKLER: One of the things that you wanted to talk about, hearkening back to our first session, was relations with foreign navies. You mentioned that Admiral Rickover kind of cut ties with the Royal Navy. That's something you worked to reestablish, as far as submarines were concerned.**

**McKEE:** I wouldn't say he cut the ties; he just let them wither on the vine. He didn't announce that he would no longer work with them, he just let the agreement fade away. It happened very quietly. It was not a big issue. The British were far enough along to take care of themselves. However, I felt that it would be in both our national interests to reestablish the relationship that had existed when HMS Dreadnought (the first RN nuclear submarine) was in design and construction. In the beginning it was mainly about what we could do for them in areas involving nuclear propulsion plant design. But by the time I got in the job, I had concluded that there were a number of areas in which they could be helpful to us as well as we to them.

We could learn from each other, and we ought to be talking. For example, they had at least one submarine prototype reactor plant they had designed and built for SSN's that followed Dreadnought. They were going to put it out of commission. That offered an opportunity to do full scale testing of the potential for battle damage to limit or prevent continuing propulsion plant operations. We were not at that time in a position to do such testing.

The USN had operated safely and well for a long time with never a serious propulsion plant casualty. That was (and is) clearly of primary importance, but we needed some first-hand experience with serious casualties and so did they.

There were other areas as well. We were already cooperating across a number of tactical areas. As I told you in an earlier session, I had Royal Navy SSN's in Task Force 69 in the Mediterranean.

We had good friends over there, so after I relieved Admiral Rickover I set out to reestablish cooperative efforts in my areas of responsibility. We drafted a new agreement. I presented it to the First Sea Lord (who was a friend from early Skipjack and Skate days). I told him we ought to start working together again, and described what we could do for them and what I thought they could do for us. (The draft)

He said, "Well, how do you want to go about it?"

I had a draft agreement ready for that question. I suggested that we both sign the paper. He signed, so did I, and we got started. He told his seniors what he was doing and I told mine what I had done. Some of our respective seniors in the chain of command may have been a little upset about how we went about it, but we both would have been in retirement by the time this deal could have been done through normal channels. That arrangement still is in place.

**WINKLER: Okay. Any other ties with foreign submarine services?**

**McKEE:** Not really. The French were always somewhat out of sorts because we would not exchange nuclear propulsion information with them. That situation began with Admiral Rickover and continued with me. We simply didn't want to get involved with them.

**WINKLER: Okay. The Walker spy ring – did that have any impact on Naval Reactors?**

**McKEE:** No, not really. The Walker spy ring did have a significant effect on tactical operations by our SSN's, but it did not directly affect our work. Other, less publicized problems had a more immediate technical effect. One was the Carter administration's decision to allow nine-axis computer-controlled milling machine technology to be given to the Soviets. That gave them the ability to build sophisticated submarine propellers that can reduce blade rate noise. That was the bad news, but there was good news as well. The good news was that the decision caused such a flap that the administration stopped or seriously reduced giving that kind of technology away.

On balance, I think we were probably better off. The Soviets would eventually have learned to make or buy those machines for themselves. It at least put the brakes on the process (for a while). Things are as bad or worse now under the Clinton administration in terms of uncontrolled technology transfer.

As far as I know, there was little or no technical information involved in the Walker business. Most of what he gave away was operational. All of a sudden the Soviets came to realize that they were not hard to detect and trail, repeatedly and continually, almost everywhere they operated. Up to that point, I don't think they had had any real understanding of how much difference there was between our tactical capabilities and theirs, particularly in terms of acoustic performance. I'm sure Walker information turned up the gain on their efforts to develop quieter submarines. But again, there's good news and bad news. It eventually forced the Soviets into a bastion situation with their SSBN's, and as a result, we had a better idea of how to get at them because we knew where they would be. It would not be easy for our SSN's to go in there against their improved submarines, but in a strategic sense they were far worse off than we because they had to hold fleet assets back to protect those SSBN's. So there was good news and bad news in all of this, but clearly the bad news in the Walker case outweighed the good.

**WINKLER: The one thing on the bastion: somebody has to take a look at the Soviet, now Russian, archives to determine whether or not the bastion strategy was because of Walker or the fact that they just had ballistic missile submarines that could launch from Murmansk alongside the pier.**

**McKEE:** The question is, which came first? I don't really know. They must have been working on those missiles long before Walker and company did their thing, and so were

we, but we didn't go into a bastion situation with Trident. What we did was spread out all over the oceans. I think they would have done the same thing without Walker.

**WINKLER: Were there some high points during your tenure that we're overlooking here? Or is it day in and day out basically similar things going on?**

**McKEE:** Naval Reactors? There were a lot of high points. Every time I talked to the young people in our submarines was a high point. We used to call them "prayer meetings." I flew to each one of the bases where nuclear ships were stationed, talking to young nuclear-trained officers and enlisted men, not just about the NR program, but about the importance of what they did for a living.

The success we enjoyed in development and design for the SSN21 propulsion plant was another high point. It was remarkable. We set a quieting goal that nobody thought we could make. We developed silent main coolant pumps. I felt that natural circulation plants were a little too ponderous for an SSN. We were able to improve on Trident quieting at all speeds with a reduced flow forced circulation plant.

**WINKLER: What was the prototype plant for natural circulation?**

**McKEE:** There were two: the Narwhal and Trident prototypes.

**WINKLER: Okay.**

**McKEE:** One of our prime contractors developed those new main coolant pumps. I was there for the first run. I stood beside the pump, with my hand on it, and asked: "Okay, when are you going to start it?"

They said, "It's running." I couldn't tell whether it was stopped or started. That remarkable technology should also be in Virginia – the SSN that will follow the Seawolf class. I'm going to go up and ride the Seawolf in about two weeks for the first time. I'm looking forward to the trip. That will certainly be a high point, though much delayed.

**WINKLER: Other high points? What percentage of the time...**

**McKEE: Renewal of our agreement with the Royal Navy** was definitely a high point.

**WINKLER: Okay. Sure. How many of your staff did your office lose?**

**McKEE:** Almost zero. Everybody stayed. A few young people turned over. Admiral Rickover's deputy left early on. He took another position in the Department of Energy. That was fine. He deserved to move up and I had a great guy ready to relieve him..

**WINKLER: My focus has been on the Navy, but you went through, I guess, a Secretary of Energy change while you were there?**

**McKEE:** Yes. We had Donald Hodel (he had been Secretary of the Interior) in the top job. Earl Gjelde was the Deputy. They were great to work for. I don't believe they have been in Washington since that time.

There were a lot of high points in the Naval Reactors job. Every time I saw those big ships leaving for or coming back from deployment was a high point.

**WINKLER:** **That's what I was getting at before, as far as traveling out of the office, you probably spent what, about half your time on the road?**

**McKEE:** No, about a third of it. About once or twice a year I visited major fleet areas and deployed support facilities. The rest of the time I was in the office, traveling to prime contractors, in some of the operating ships, on sea trials, and inspecting nuclear capable shipyards, etc.

**WINKLER:** **During the time period, what would you consider the greatest crisis?**

**McKEE:** Crisis? I think it was a last-minute effort by a congressional staffer to kill the Seawolf program. He called a Congressional hearing for that purpose. Bruce DeMars (my eventual relief in NR) and I testified. Bruce was OP-02 (CNO's Deputy for Submarine Warfare) at the time.

**WINKLER:** **At that time, yes.**

**McKEE:** We testified before the House R&D Subcommittee, with almost a full house attending. We won the argument. That could have been a real crisis, but we managed to defuse it. Otherwise, there were day-to-day problems to deal with, but no big crisis.

We did a lot of other things, and put in place a number of initiatives. Up to this point, I may have made it sound as though all we did was keep things hot, straight, and normal until the next guy came along. That was not the case. When Bruce DeMars reported as my relief, I had the section heads take him through all of the important activities that had been started between the time I got there and when I would leave. Let me describe some of them for you.

We did a lot to improve battle damage resilience and reactor safety. We did extensive drills, and built a control center in the office so if there was a reactor problem anywhere in the world, we could be involved in the solution. We revised the operating and casualty procedures for surface ships and submarines to make them simpler and more useful.

We ran important experiments on an old SSBN (PATRICK HENRY) to determine what actually happens in the event of a major steam leak. to determine what actually happens in the event of a major steam leak. We did the same thing for a primary leak in cooperation with the RN.

We began designing and building simulators, and incorporating them into our training. Admiral Rickover was opposed to the use of simulators; for several good reasons. His logic was that when you're learning on a simulator, you may tend to treat it as some sort of video game; knowing nothing bad can really happen. Admiral Rickover was right. Training is clearly more serious with real reactors. That's one side of it, but there is another side as well. Even our best qualified reactor operators have never seen the panel indications that would appear if there was a serious reactor casualty.

Today NR has simulators integrated into the training program along with actual reactor operations. I saw one of the first down in Charleston. It is full scale, and is very sophisticated. I was very pleased.

In the interim, we built a much simpler training device that could go to sea with the ships. The project was started because of my concern for the ability of SSN CO's to maintain engineering operational proficiency under the ice. Some CO's are reluctant to do complex drills that could result in loss of propulsion up there, so I had one of the laboratories develop a training device small enough to go down a submarine hatch.

This device enabled drill instructors to demonstrate power plant casualty indications. It was not interactive. The instructor would set in a dynamic simulation they wanted to demonstrate. Then before energizing the simulator to show what plant indications would do, he would ask each individual what he might expect to see. Then he would run the demonstration. That way, he could learn who really understood the plant. The device was simple, though somewhat constrained, but it was an early approach to what I wanted — the ability to see how plant instrumentation would behave in extremis.

The S6W reactor plant for SEAWOLF was certainly a high point. That was our most comprehensive technical initiative. We also started conceptual design on a next generation submarine plant before I left. Several new concepts are involved in that plant. It will have components that are dramatically different from anything that has been used before.

We developed techniques to apply high power-to-flow design principles developed for use with natural circulation plants to low flow forced circulation plants. That has enabled much higher reactor power with much lower pumping power, giving us the flexibility of forced circulation without the operational complexity.

We developed and began new deploying micro-processor based instrumentation and control equipment in all of our plants. With this technology, we have instrumentation that is much more accurate and much more reliable. Among other advantages, this enables substantially higher power operation for the same plant hardware.

Finally, we shock tested a NIMITZ class CVN for the first time.

**WINKLER: I interviewed MCPON Bushey. He was on the Roosevelt when you shock tested it.**

**McKEE: We also shock tested a 688 class SSN for the first time.**

There were other initiatives that might be of interest. We developed a way to ultrasonically test and anneal a highly irradiated reactor pressure vessel., thus substantially extending the operating life of the vessel. That has not been done before..

**WINKLER: Just going back to the Roosevelt. The purpose of shock testing something is just to see how the piping and everything holds up?**

**McKEE:** Right – to see how everything holds up; piping, weapons, sensors, propulsion systems, engineering auxiliaries, aircraft handling systems, etc. Naval Reactors has led the way in shock testing for a number of years. Surface ships did little shock testing after World War II until Admiral Rickover demonstrated the importance of doing it.

I talked about the CONAG surface ship propulsion plant. That would have made a very interesting ship.

We were also involved with the development of a new design aircraft catapult for the CVN's. That catapult will enable CVNs to launch aircraft at lower reactor power levels, thus saving wear and tear on the plant, and extending core life. The solution was really quite simple – just increase the volume of the steam chamber. That gives a stronger yet softer kick, but the aircraft still gets the same boost at the end of the ride. That did good things for the propulsion plant. It even gave the ship the ability to launch heavy aircraft with one reactor plant down.

**WINKLER: One of the big things they're talking about now is COTS, commercial off-the-shelf technology. Was Naval Reactors looking at what was out in the commercial sector at that time?**

**McKEE:** We paid some attention to it, but found nothing really helpful for our applications.

**WINKLER: Oh, okay. Yes.**

**McKEE:** We also obtained authority for and procedures for the disposal of decommissioned nuclear submarine. That had begun before I arrived. The basic question was what to do with the de-fueled reactor and the decommissioned nuclear ships.

**WINKLER: How did you handle that problem?**

**McKEE:** I'll describe the process for a submarine, but surface ship disposal is much the same. The decommissioned (and de-fueled) ship is taken to a nuclear capable shipyard

where the reactor compartment, and all reactor-associated primary coolant systems are cut out of the hull. The reactor compartment is sealed, placed on a barge, and taken up the Columbia River for burial at a DOE site in Hanford, Washington. There is no high level radiation involved, because core fission products were removed with the expended core. There is only residual low level radiation in steel structures.

The process I have described was not our first choice. The best way to dispose of old nuclear ships would have been to remove the expended core, seal the reactor compartment, and sink them in the deep ocean (e.g., the Marianas Trench). That was technically quite feasible, but not politically acceptable. In fact, it went to the extreme. Today, we remove the reactor compartment, and bury it, then weld the hull back together with nothing radioactive left in that hull. What we wanted to do was to tow those hulls (with no remaining reactor components) out and sink them in the deep ocean. We were unable to do that either, because what was left was still called a “ nuclear submarine.” So we today we probably pay about twenty million dollars more per decommissioned submarine more than is really required to do the job safely.

**WINKLER: The Russians, on the other hand, kind of have taken a lot of their old submarines and pulled the sea cocks?**

**McKEE:** I gather that they just sort of walk away from them. I don't know exactly what they do.

Let's see, what else? Oh, I should mention Shippingport. We shut down the Shippingport nuclear power plant. Do you know what that is?

**WINKLER: No.**

**McKEE:** Shippingport was the first commercial nuclear reactor power plant in the United States – perhaps in the world.

**WINKLER: Oh, yes. Shippingport...**

**McKEE:** Pennsylvania.

**WINKLER: Pennsylvania.**

**McKEE:** Right. The plant was designed and built by Admiral Rickover's organization. After the commercial nuclear industry got into high gear, there no longer was a need for this small (65 megawatt) plant. Admiral Rickover did something, that at that time, was considered technically impossible. He and his people turned Shippingport into a light water breeder reactor. Up to that time, a breeder could only use liquid metal as a primary coolant. He did it, and it worked, but nobody was interested, so we shut the plant down. However, the entire development and test program was documented in great detail. If you want to do some research there are four shelves of documentation available.

Changing the subject a bit, toward the end of my tour we did get into a diplomatic argument with the Canadian government. Have I told you about that?

**WINKLER: No.**

**McKEE:** A new (at that time) Canadian Defense Minister had become convinced that his navy should have nuclear submarines.

**WINKLER: Oh yes, I remember that.**

**McKEE:** The Minister and his Navy Chief of Naval Staff came up with a program to build a number of SSN's over a twenty-year period. It soon began to appear that the project was driven more by industrial interests in the U.K. and France than by military necessity. We were in a position to influence the outcome of this issue because in our original agreement with the British government, the RN agreed that they would not release any nuclear propulsion information without our concurrence. In the Canadian case, I refused to agree. The situation became somewhat dicey; we even met with President Reagan in an effort to resolve the situation.

The whole idea was ill conceived at best. At that time, the Canadian Navy was about the size of the New York City police force (in terms of manpower.) Nuclear submarines are very expensive and difficult to build and maintain. By our accounting, the Canadians would have had to lay up most of the rest of their navy; destroyers; everything – to support an SSN fleet of the size they intended.

The Canadian plan also failed to provide for an adequate industrial infrastructure to support their SSN's. They would obtain the boats from Britain or France, then take them back to the builder for repair (or overhaul). Also, what should have been a matter of concern to them was the fact that they would be building basically same design for ten to twenty years. The first few might have been tactically useful, but most of the class would probably be obsolete before the end of the buy.

**WINKLER: They just didn't like being told that it was...**

**McKEE:** That's right. The Minister of Defense became quite upset when I told him we would not authorize release of the nuclear propulsion information he would need. I was somewhat direct in my discussions with him. Later, I felt somewhat badly about that.

Everything came out all right in the end. The Defense Minister left office and the whole idea was dropped. That was good. Some of the Royal Navy people I talked to seemed a bit concerned about the project for many of the same reasons I was, but I suspect they were being pushed hard by industrial and political interests.

**WINKLER: Wasn't there some sensitivity within the Canadian government over the fact that we transited through Canadian waters?**



**McKEE:** I understand that was part of it, but I suspect that was a red herring. We told them what we were doing in the Arctic. But the fact that we could operate SSN's in the Arctic and they could not may have bothered some in the Canadian government. However, that argument soon fell apart.

New subject. We enjoyed excellent relations with the Government Accounting Office during my tour. They didn't look at us often but whenever they did, the report was generally favorable. Some in that office initially appeared to be influenced by the conventional wisdom that NR must have been getting away with a lot because the GAO had rarely looked at our programs. I had been there only a couple of months when several junior GAO people showed up, announcing they had been sent to investigate reactor safety in the Naval Reactors program. Few seemed to have enough technical background to understand, much less evaluate, what we might have told them.

I decided to seek an agreement with the Comptroller General. We would run a course of instruction for members of his senior staff in areas that they might want to investigate. The course would be conducted on Saturdays. We would give them some sort of exam at the end of the period of instruction. Everyone who completed the program would be taken to sea in a Trident submarine. (the graduation exercise.). They all came. The arrangement proved quite helpful to both sides. (I'm not sure we ever gave anyone an exam, or if we did, how our "students" actually performed.)

Finally we continued to support SSN operations from the Submarine Tender in La Maddelena (Sardinia). I believe we talked about that.

I think that's about enough "what we did" items.

**WINKLER:** Yes. Let's see, when I was over there I guess the Orion was the sub tender. We made a port call there, and actually held a court-martial on the Orion for a couple of shipmates. They threw our bell over the side; that's what they were being court-martialed for.

**McKEE:** Threw the bell over the side?

**WINKLER:** Threw the bell over the side. Do we still have a facility over there?

**McKEE:** Yes. .

**WINKLER:** I wondered, because we had pulled a destroyer tender out of there. Well let's see, I think what we'll do is go ahead... Let me go ahead and ask about the selection of your successor.

**McKEE:** Very early on I had decided that the right man to relieve me was Vice Admiral Bruce DeMars. There was no question in my mind. I'd known him for a long time. I saw him perform with distinction in at least two very difficult situations.

I first took notice of Bruce DeMars when he briefed the CNO (Admiral Hayward) on “Fat Albert.” (Bruce was a captain in OP-02 at the time.) At the end of a very balanced briefing, the CNO asked Bruce for his opinion. Bruce told him the design was unacceptable. The CNO did not seem to like that answer. “What do you mean, it’s unacceptable?” Bruce stood his ground, explained his conclusion. “Fat Albert” eventually died.

Later, as a flag officer, he was Chairman of a major Selection Board. When the Board reported out, SECNAV decided that there were not enough officers selected from one of the three line officer communities. He directed Bruce make changes in the final list. Bruce told him that was against the law. If SECNAV wanted the list changed, he would have to reconvene the Board.

(END OF SIDE A, TAPE 2)

**WINKLER: Continuing on with the selection board.**

**McKEE:** The list remained as it was.

Bruce is a tough-minded, honest guy. He is also very bright, technically competent, tactically adept, and totally dependable. He is far less volatile than I. We were a good team in testimony on the Hill when he was OP-02 and I was NR. I would sometimes get upset during the course of a committee hearing. Bruce could make his point with less sound and fury.

I knew Bruce was the right man for the job, so I encouraged BUPERS and the CNO to make sure he would be available when my tour ended. That was not a small problem. Everyone agreed that he was the right man for the job, but I am convinced that he could have had any four-star job he wanted. I worried from time to time that he would begin to feel he was being held back, but if he did, he never let on. After I was gone, he did a superb job; in far more difficult times than I had under the Reagan administration.

**WINKLER: Yes. I imagine if the trials and tribulations of Seawolf occurred on your watch, you might have pulled your hair out.**

**McKEE:** Problems did occur on my watch; primarily in the process of obtaining the initial approval and funding for Seawolf. Bruce had to handle the opposition after the boat was authorized and appropriated.

**WINKLER: Yes, the efforts to kill the thing.**

**McKEE:** Well, yes. Do you remember the “Admirals’ Revolt” when the Truman Administration tried to kill Navy tactical aviation? That attempt failed because several flag officers had the talent and the courage to oppose. I believe the move to terminate Seawolf was much the same sort of thing – except this time it was directed at the Submarine Force. I said as much in my 1999 address to the Submarine Development

Squadron 12 gathering (attached). Bruce DeMars was able to keep only three of the Seawolf class, but the next new SSN (Virginia), though not as capable (or expensive) as Seawolf, will be the right design for this time. In my judgment, what Bruce and other risk takers were able to accomplish ranks right up there with what Arleigh Burke and the “Revolt of the Admirals” were able to do.

Finally, I should tell you that I left my NR tour one year early. By law, mine was to be an eight-year tour, but there was no prohibition against my requesting retirement at any time. For a lot of reasons, I wanted to have Seawolf authorized and appropriated with Bruce DeMars in place before the presidential election. We had already obtained the authorization and an appropriation, so I departed shortly after he arrived.

**WINKLER: Right.**

**McKEE:** I retired at the end of October 1988. I was very pleased to leave the program in good hands. I might have stayed longer. I was asked to consider another tour, but that would not have been the right thing for me to do.

**WINKLER: Who...they? Who being “they?”**

**McKEE:** The CNO, Carl Trost, told me to stay as long as I wanted to.

The Superintendent of the Naval Academy at that time (RADM Virgil Hill) – a former SSN skipper - held a beautiful retirement parade and ceremony for me at the Naval Academy. They saw me off in grand style.

**WINKLER: A quick overview of what you did afterwards?**

**McKEE:** Well, I turned to consulting on a limited scale. I worked with two major architect-engineering firms. I also served on the Board of Directors for two nuclear-equipped electric utilities: PECO Energy (formerly Philadelphia Electric) and the Entergy Corporation. I stayed with them until this year, when I arrived at the statutory retirement age (seventy). I left PECO first, because in the new environment of electrical industry competition we were approaching a conflict of interest situation.

**WINKLER: Also a member of the Board of Governors of the Chesapeake Bay Maritime Museum.**

**McKEE:** Yes, and for a while I was the Chairman of the Board of the Naval Post Graduate School.

**WINKLER: As I recall, you never attended there, did you?**

**McKEE:** No. There wasn't time.

**WINKLER: Well this is a good place to close. Thank you again for your time.**

