



ORAL HISTORY INTERVIEW TRANSCRIPT

INTERVIEW CONTROL NUMBER: 11-C36

INTERVIEWEE: Cmdre Dennis Reilley

INTERVIEWER: Roger Chiasson

DATE OF INTERVIEW: 11 July 2011

LOCATION OF INTERVIEW: Pubnico, NS

TRANSCRIBED BY: Joy Thatcher

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Cmdre Dennis Reilley
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Interviewed By Roger Chiasson

Interview starts

INTERVIEWER: This CANDIB interview was conducted in Pubnico, Nova Scotia on 11 July 2011. The interview was conducted with Cmdre (Ret'd) Dennis Reilley. The interviewer was Roger Chiasson. Both have signed the oral history interview release form. As with other CANDIB interviews this interview deals with the Canadian Navy's relationship with Canadian industry. Commodore Reilley has had extensive dealings with Canadian industry through a number of positions he held during his long and distinguished career as a maritime engineer in the Navy. Specifically the scope of this interview will cover four distinct periods in Commodore Reilley's career. First, as Director at Maritime and Electrical Engineering or DMEE in Naval headquarters or Canadian Forces headquarters where he led a large staff of naval and civilian engineers commonly called life cycle material managers or LCMs. They were responsible for engineering support in its broadest terms including interfacing with a large variety of Canadian firms contracted to supply equipment for the Navy. Secondly, as principle overseer in the Naval Central Drawing Office located in Vickers in Montreal during the DDH 280 class project. Thirdly, as project manager TRUMP that is Tribal Update and Modernization Project responsible for the conversion of DDH 280 class ships primarily for area air defence and task group command capability. Fourthly, as project manager for the Canadian Patrol Frigate project responsible for construction of twelve Halifax class frigates. I will now ask Dennis to give us a brief biography of his career and how he came to hold these various positions which featured significantly in the Navy's relationship with Canadian industry, Dennis.

REILLEY: Going through my complete biography would take several hours as is always the case when you've spent thirty seven years in an institution so I'll very briefly indicate some of the high points along the way. I joined in 1957, went to Collège Militaire Royal de Saint Jean, graduated from RMC in 1962. From there I went out west and commissioned the HMCS SASKATCHEWAN in her first commission; went to Halifax for engineering upgrading in the mid- sixties; was engineer officer of three ships in Esquimalt, British Columbia; two of the ships were Prestonian Class frigates. I was engineer officer of the last Prestonian Class frigate to be sailing in the Canadian Navy. From there I was involved in naval overseeing in Vickers Montreal for the DDH 280 program as Roger indicated earlier. Off to Staff College; back out west became training officer for marine systems engineer candidates at the Officer Training Division at Fleet School Esquimalt, two years there. Then I was promoted to commander and became Squadron Technical Officer of the Fourth Training Squadron in Esquimalt; some interesting things there that I'll get in to later. After that two year appointment I was appointed to Royal Roads as vice commandant - an interesting job, out of trade so to speak- marvelous job. From there I was appointed to Ottawa as section head of future ship concepts in DMEE; I'll get in to that later. Promoted in 1979 to captain and was appointed director of DMEE; three years there. I was then

appointed as Base Commander Cornwallis new entry training base which I commanded for three years. I was then in 1985 appointed to the National Defence College as a course member for one year and then subsequently as a director for two years and in 1988 I was appointed to Ottawa as Project Manager at TRUMP. 1990 promoted to commodore and appointed Program Manager of Canadian Patrol Frigate program and my last appointment was as an, as the Naval attaché in Washington from which I retired in 1993 after thirty seven years.

INTERVIEWER: Well thank you very much for that introduction Dennis. What I'd like to do now is to cover the four aspects of your career that I mentioned in the introduction and under each of those headings what I'd like to do is talk about the relationships between the Navy and the individual contractors that you were interfacing with as well as the challenges that you encountered, whether it was contractor related or not, and also of course the lessons learned because it's been my experience that we often repeat the mistakes that we've made before. So lessons learned are very valuable indeed. So I'll let you start off presumably with your experience in 201 Canadian Forces Technical Services Detachment in Vickers in Montreal.

REILLEY: Okay before I go any further I know that the prime purpose for this interview is CANDIB but I also want to emphasize that certain dimensions of the sorts of things I'm going to be discussing today bear directly on Naval history and so I hope that portions of this or the entire thing will be given to the Naval historians as well to do what they see fit.

INTERVIEWER: Well absolutely.

REILLEY: Okay in Montreal the 201 Canadian Forces Technical Services Detachment I was involved with approving the working drawings for the building of the ships. There were two yards involved with it; one was Marine Industries in Sorel, Quebec, the other yard was Davie Ship in Lauzon, Quebec. There were challenges to that because the two yards were competing to produce the first ship and because of that the drawings weren't all entirely exactly the same and to try and keep control of this was a tall order. Nonetheless I was involved in overseeing and approving the drawings and you'll if you look at some of the old drawings you'll see my signature at the bottom dated 1969, 1970 and into '71. The Naval Central Drawing Office was contracted by Vickers to the Crown and the overseers, the 201 CFTSD, basically were overseeing the Naval Central Drawing Office producing the drawings and the NCDO was housed in an old upstairs drafting loft and most of the draftsmen were Scotsmen and I suppose in those days there probably would have been somewhere around a hundred, one hundred and fifty draftsmen working in that what I would term a sweat shop in the summer and a freezing refrigerator in the winter. I had absolutely no experience in producing working drawings and in overseeing drawings, but I learned very quickly under the tutelage of a guy named Charlie Cameron who was basically the person in charge of producing the ship's fitted marine systems drawings, which basically were piping systems for everything from lube oil to the main engines to exhaust systems for the gas turbines and so on. Charlie was a very capable person, very effervescent, very hard-nosed, but fair and we got along just fine. A couple of the things of interest at that particular location; we had to produce the propeller shaft and propeller installation drawings and also produce drawings for the mountings. Nobody had

done this. The staff at 201CFTSD had to produce them and I got involved in designing these, which was exceedingly interesting. Another of couple of things we got in to of interest were the main engine on-raft and off-raft interfaces. Also the main engine...

INTERVIEWER: Dennis if I could just stop you here. I know since I was also involved in the 280 project that this raft that you're talking about was quite unique and I know you had challenges in the drawing phase and we also had challenges in the installation phase so could you tell us what we mean when we talk about the raft installation.

REILLEY: Yes, this class of ships, the design of the class of ship was a very advanced in terms of reducing the underwater-borne noise for antisubmarine purposes to reduce the ship's signature. One of the concepts developed by the Navy, which was then of course engineered in to these ships, was the concept of having the gearbox and engines mounted on a raft; rubber mounted basically in simple terms on the raft that of course isolated the noise and didn't allow the noise to be translated through the hull into the water and therefore susceptible to being intercepted by an enemy submarine along the way. Canada was very advanced with this concept at that time; I think we were the first Navy to really get into that and it was quite exciting.

Another interesting thing we got into was the main engine installation and withdrawing drawings. Basically if an engine had to be changed out it had to be able to be extracted from the ship and of course reinserted out once repaired or a new one put in. Two ways to do it; cut a hole in the side of the ship and take the old engine out, put a new one in or as we discovered the best way to do it was to take them out through the funnels and that was a real challenge; getting all the right angles and right clearances on the way out and the way back in.

Marine Industries in Sorel had several large claims against the Crown. It's the old shipyard propensity to claim for what they see are arisings and make some extra money along the way. I was involved in that. I had to spend about five or six months in Sorel negotiating with the Sorel engineers, pipe by pipe, valve by valve, control system by control system to make sure that what they claimed was valid. In some cases they'd claimed for a particular system, but had only given us credit for an offset for half the system and so you had to be quite wide awake and on the ball. Luckily at that time, I'm still, completely bilingual and the two engineers I was working with didn't realize I was bilingual and were jibber jabbering to themselves in the margins about this that and the other thing and of course once I fessed up to my ability they became my best friends forever.

Lessons learned. When you get into shipbuilding certainly in Quebec being bilingual is certainly an asset and I would say it's almost absolutely mandatory. The negotiating tricks I just mentioned. Also I learned very early in the game not to play games with the contractor. Be up front; treat them with respect even if they may not deserve it. Eventually they'll come around. If you get into a confrontational situation with them then it's never ending and it's counterproductive; will cost all sorts of time and money unnecessarily.

INTERVIEWER: Dennis that was a very good *tour d'horizon* of 201 CFTSD and the NCDO in Vickers in Montreal, but your comments raised a question in my mind and I think I know the

answer, but we'll talk about the Canadian Patrol Frigate a little later and we all know that the Canadian Patrol Frigate was probably the first single total systems responsibility type of contract that was awarded so that the contractor had total systems responsibility for every aspect of the deliverable, the ships, including selecting the weapon systems and systems and the design. We know that Sorel Industries was the prime contractor for the DDH 280 project, but I wonder if you could address the differences between the total systems responsibility approach, which is now pretty well the norm for major capital procurement, and how it transpired in the 280 project.

REILLEY: Okay the total systems concept which was used for both the TRUMP programs and the Canadian Patrol Frigate programs in essence required a prime contractor to design and build a ship that would meet performance specifications, or in other words capability specifications that the government produced. This would be a fixed price contract and hopefully the ships would be delivered on time and on price. For the original DDH 280 program in the late sixties and into the seventies the Navy did the design using the Naval Central Drawing Office as the producer of drawings. There was a lead yard, which was Sorel Industries in Sorel, Quebec now called Marine Industries. They were to produce the first ship and the drawings for the follow-yard which was Davie Ship in Lauzon, Quebec were to be the same drawings as the drawings used for Marine Industries or Sorel Industries in Sorel. This was as I recall, I could be wrong about this but I seem to recall it was a cost-plus contract which meant basically that the contractor or the builder would of course identify the cost and then he would make a profit on that; appropriate profit. An interesting thing here though is that even though Marine Industries was supposedly the lead-yard, the yard to produce the first ship with the first drawings, Davie Ship in Lauzon, were very aggressive and they indeed overtook the Sorel group and their ship, their first ship, came out earlier and their drawings were quite a lot different as I mentioned earlier in my discussion.

INTERVIEWER: That's a very interesting comment you make about lead-yard and follow-yard because having been the deputy project manager construction in Saint John Shipbuilding during the Patrol Frigate project we had exactly the same problem where the lead-yard drawings weren't keeping pace with, with the construction schedule in the follow-yard that was for the first six ships. So history does tend to repeat itself.

Good well I think that completes our discussion of the Naval Central Drawing Office. I wonder if you could now give us a quick *tour d'horizon* of your time as Squadron Technical Officer.

REILLEY: From 1974 to '76 I was the Squadron Technical Officer of the training squadron in Victoria. Exceeding interesting job; I had four destroyers and six minesweepers used for training officers plus a whole gaggle of small little training vessels including HMCS ORIOLE the sail training ship that everybody knows so well in Esquimalt. The reason I mention this is ORIOLE when I became Squadron Technical Officer had her masts taken off, the masts were rotting on the jetty. The ship was basically rotting and abandoned by the Navy. There was no interest in doing anything with her and basically she was going to be sold for scrap and done away with. Being a person who does a lot of sailing and loves boats, sailboats and so I took it upon myself to get things cracking with the approval of Admiral Pickford who was the Admiral in Victoria at that time, MARPAC, and Captain Dick Okras for whom I worked and a bunch of other people to

surreptitiously rebuild the ORIOLE. Admiral Boyle was in, in... Dougie Boyle was the Commander of the Navy at the time and he had no time for sail training; no time for anything but destroyers and Naval ships that did their proper thing. He thought that sailboats were frivolous. So we rebuilt this, we actually had to rebuild quite a few plates; she was riveted and nobody had riveted in the Navy for thirty years, but we had rivets flying in the dockyard. She was rebuilt and whenever Admiral Boyle came in to Victoria for one reason or another we would tow the ORIOLE around to Pat Bay and hide her in one of the islands there so he couldn't see her. Then we'd tow her back and keep our work. Anyway I gather that ORIOLE is still sailing today and proudly training Naval young officers and doing her thing for the Navy and for the country indeed.

INTERVIEWER: Thank you very much Dennis that was a fascinating account of our sail training vessel almost having died a horrible death and thank you for revitalizing it. We'll now go on to your experience in DMEE if we could.

REILLEY: Okay when I left Royal Roads in 1978 I was appointed Section Head to DMEE 2 and this is a section head for future ships marine systems concepts. I was in that section only one year, but nonetheless it was a very interesting year. A couple of things of note I should mention. We initiated a minor research and development project to fund an outfit in Vancouver called Ballard Fuel Cell Technology Company. I don't know if that's the exact name but Ballard Engineering is well known and we wanted to develop the fuel cell technology as a possible means of converting the O boat, the O class submarines, to air independent capability. Now at that time the Navy was playing with the idea of obtaining nuclear submarines and one of the options was of course to have air independent submarines using the fuel cell technology. Anyway it's quite interesting because Ballard was going nowhere at that time. They were barely a blip on the radar and they seemed to have capability but very little work and our fear was they were going to disappear. They were the only outfit in Canada that could help us in this regard so we threw some money at them and they developed what they were contracted to develop. Of course Ballard went on as we all know to get into other venues, one being fuel cell technology for automobiles and so on.

INTERVIEWER: Can I just interrupt here for a second Dennis. I think Ballard at the time though was providing replacement batteries for the *OBERON* class submarines. Am I correct?

REILLEY: I don't know, they may have been.

INTERVIEWER: I think, from my experience in the dockyard in later years, I think that was that was one of their bread and butter activities. I think you're right in saying that it was a very tenuous...

REILLEY: Right.

INTERVIEWER: ...operation and I think the Navy was probably keeping it alive.

REILLEY: Absolutely, no question. Another thing that was ticking along when I became a section head of future ship concepts was an acronym called SHINMACS, SHINCOM and something called ship integrated NBCD. We started, I started preliminary work under minor development contracts for SHINMACS and SHINCOM. SHINMACS stood for ships integrated machinery control system. SHINCOM stood for and stands for ships integrated communication system. Indeed we in the Navy wanted to ensure that these particular systems in whatever new ships came along and we knew that the Canadian Patrol Frigate was an option in the relative near future that these systems should be developed. There wasn't much interest in the Navy for SHINMACS or SHINCOM or indeed for SHIN NBCD. There was a lot of interest in the Navy for something called SHINPADS which was an equivalent of a fully automated distributed architecture weapons control system. So the marine system systems were sort of a poor cousin and not really taken seriously. Anyway we initiated the minor development projects for SHINMACS and SHINCOM and I'll get into the outcome of that when I get in to my next little talk on DMEE.

Okay so I was promoted to captain and took over as Director of Marine Electrical Engineering for the Navy and as I mentioned I was very, very interested in ensuring that future concepts for the Navy were developed particularly for the marine systems brotherhood if you wish because the combat systems engineers at that time were making noises about taking over most of the marine systems responsibilities in the future because only they knew about software and automatic systems and so on through their SHINPADS experience. I being sort of the head of the marine systems engineering brotherhood at that time or fraternity I should call it thought that marine systems engineers should have a capability to continue with the work of being responsible for the providing and provision of propulsion electrical power generation and so on for ships of the future. Therefore I took very seriously the business of this future technology and funded by a minor research and development project, a display model as a means of obtaining approval from John Killick who was ADM MAT at that time and we wanted this to transfer into a Major Crown Project once it was approved. Indeed it was approved as a minor and after year two transferred into a Major Crown Project and was assigned to CAE Canadian Aviation Electronics in Montreal to develop a full blown SHINMACS system.

However when the Canadian Patrol Frigate program came along, the TRUMP program came along, program came along the concept of procurement was negative guidance which meant that the Navy could only designate performance characteristics that they wanted from the ships, they could not specify particular systems or designs that they wanted. Nonetheless we continued with the major project, major development project for SHINMACS because CAE believed that even if they couldn't sell it to the Canadian Navy they could sell it to other navies around the world. Because of this when eventually the design was matured through Saint John Shipbuilding for the Canadian Patrol Frigate program and through Litton Systems for the TRUMP program, they saw that there was a very excellent SHINMACS machinery control system capability alive and well in Canada and they knew that they would get extra credits for obtaining these systems through a Canadian company rather than through a foreign country. So we were very pleased that SHINMACS was developed and installed in the TRUMP programs and in the CPF programs; likewise for SHINCOM. Now Shin NBCD never really matured into a separate program, but nonetheless the concept was engineered into SHINMACS and I haven't been on these ships for

several years now but I seem to recall that SHINMACS certainly has NBCD control characteristics built into it. In essence that's what we have as a ships integrated nuclear biological chemical defence system involved.

Okay back to SHIN NBCD Roger jogged my memory that there was a little outfit from Montreal that produced a standalone NBCD console that was located in the machinery control room of the CPFs that basically was a successful system. I don't know if the company is still exists, extant today - was a little outfit in Montreal that produced an excellent product. Anyway that's that story.

Over to SHINCOM, we developed a development project with an outfit in Ottawa called Leigh Instruments to develop SHINCOM and indeed SHINCOM was used in the Canadian Patrol Frigate and TRUMP programs.

Also on an entirely different angle while I was there I recognized that there was no professional marine engineering journal that existed for the Navy. I found that the infantry had one and the aerospace engineers had one and so on and so forth and I tried to get something going with MARCOM and MARCOM had no interest except for the periodical they put out through the Joint Maritime Warfare School and they didn't want to have anything to do with engineering. So I got approval to proceed with something called the MARE Journal which we produced. I guess the first issue came out in 1982 and it was developed in-house and is still existing of course and proving to be quite popular not only for marine systems engineers in terms of enhancing their professionalism, but the Navy at-large enjoys it as well and contributes and that is a great satisfaction to me.

Also at that time I was very interested in the Canadian Institute of Marine Engineering. I don't even know if the outfit still exists today or not. It was based in Ottawa and the last president was a retired admiral called Peter Cairns, but that's another story. I developed something called the CI MARE Digest and the president of the CI MARE at the time was a guy named Hank Arnsdorf who was a retired naval air engineer and that digest helped industry to show off their capability and of course to advertise as well.

Okay. Another, another interesting thing that happened while I was at DMEE, we recognized that naval technicians for marine systems at the time were mainly mechanically oriented and because of the new systems they had to get cracking on future technology and software technology and more advanced concepts than simple steam engineering. So I managed to initiate, obtain approval for and developed and implemented something called the Marine Engineering Technical Training Plan based in two organizations. The English folks went to St. Lawrence College. We would take these youngsters out of high school and bring them up to a technologist level as opposed to a technician's level; three year course. The other outfit that did for the French Canadians, the French Canadians, was the l'Institute Maritime de Rimouski and that proved to be quite interesting. The youngsters spent three years graduated as master seamen, were certified technologists and greatly helped to, not only get the new advanced systems properly installed in the new ships, but of course helped to maintain them and operate them and I guess that's still going on.

INTERVIEWER: If I can just interject I'm glad you mentioned NETTP because it really was I think a first journey by the Navy into contracting out its training and education. I think it proved that there are people out there who were doing it, if not as well, perhaps better than the Navy could. So I think from the CANDIB perspective it's a very significant contribution that I don't think has come up in any of our interviews before this.

REILLEY: Two names I should mention. I was working very closely with the ADM PER people, the personnel people - a guy by the name of Russ Moore, a naval officer who basically helped obtain approval and funding for this and without his work it would have been very, very difficult. Admiral Jock Allen who was Commander of Maritime Command at the time was very helpful in producing the weight behind this particular concept and the guy on my staff that did all the leg work was a guy named Commander Bruce Baxter who was just incredibly efficient; worked extremely hard and effective in getting this program up and running.

Another thing that I was very interested in; part of the terms of reference of being a director was to encourage and enhance Canadian industry as much as possible. I don't know if it still exists in the job description but it was certainly there when I was the director. In that context I helped to kick-start an outfit in Toronto called Thordon, T-H-O-R-D-O-N, Marine Bearings. They had developed some sort of a phenolic secret formula, based on a phenolic resin, and wanted to convert this particular capability into marine bearings; heavy duty bearings such as stern tubes, shaft bearings, this sort of thing. They weren't getting anywhere and at that time the people in our Navy, the engineers, were very much focused on anything being Canadian can't be possibly of any value; you have to be British to be any good at all or maybe American. I just couldn't get anywhere but I managed to borrow from NETE, Naval Engineering Test Establishment, in Montreal a test rig that I transferred to Toronto and loaned to Thordon for eight months as they ran the tests on this and their bearings were certified through that process. If you look up on the Thordon website these days you'll see that their bearings are in nuclear submarines in the U.S. and all the world's navies including the Canadian Navy. So that was a great interest to me.

Another outfit that I had a lot to do with was an outfit in Ottawa called Davis Engineering for the development of an IR suppression system for the Canadian Navy. Again Davis Engineering was very much involved in the design and the building of those systems for the TRUMP programs and the Canadian Patrol Frigate programs. Again another example of getting the technology sort of ticking along and hopefully the main contractor in a negative guidance contract will pick up the Canadian capability and put it into the ship. Yes IR suppression basically means the suppression of the ship's, in simple terms, heat signature. A destroyer or any vehicle, a car or an airplane will have a signature that an enemy can pick up through sensors and indeed weapons can home-on and destroy what they're homing in on. So the government, the Canadian government had developed something called a DRES ball, DRES was D-R-E-S, stands for Defense Research Establishment Suffield and they sort of developed the concept which was handed over to the contractor Davis Engineer to develop further and to what they call productize and that's exactly what happened.

Also, Davis Engineering were involved in something that even to this day I can't really understand properly, but there was something called a shaft grounding system to isolate ship's hull-borne noise through the shafting and also to try and diminish the ship's signature, infra-red signature, even further. That's all I can say because... anyway we were peripherally involved in that at the time and I don't know whether that system has gone anywhere.

Another thing that was very interesting when I was in DMEE was the fact that super heater headers of our old destroyers were giving us terrible problems. There were cracks in the tubing and this could have led to catastrophic failure of a boiler with of course subsequent major damage to the ship and perhaps killing or at least serious injury to the ship's crew. I was right in the centre of that mainly because boilers were part of my jurisdiction and after several meetings at very high levels it was decided to basically shut the steamships down in the Navy and embark on a refurbishment program which was undertaken by Babcock and Wilcox in Guelph, Ontario I seem to recall is where they are - they may still be there. It took several years to get the whole program through but basically the ships were engineered, the boilers were rebuilt and the ships continued steaming. One dimension that this really helped however because the government wasn't too keen on replacing the old steamships and I gave the people in the Navy and indeed the people in National Defence leverage, political leverage, by saying look you know the ships, the old ships are rusting out, they're dangerous etc., etc., and it gave, provided a major impetus for approval for the TRUMP and certainly the Canadian Patrol Frigate programs.

Lessons learned. In DMEE it's just not a matter, or any job, it's just not a matter of ticking along and pushing paper. You've got to do something, you've got to take decisions, they may not be popular, they may not be understood but you have to run with it and if you do it's amazing how things can get done. Also minor research and development projects are an excellent, excellent way in which to start a project, a program that you believe in and once that minor project has been successful then it's very easy to switch it in to a major research and development project leading to a product that not only will get into the ship but will help Canadian industry along the way as well. By the way SHINMACS I don't know whether CAE still.., yes I guess they do; SHINMACS allowed CAE not only to use that technology for our Canadian destroyers, but also to sell that technology for the control of nuclear power plants around the world and in other sort of commercial activities as well as the naval activities. SHINCOM was certainly used in the Canadian Navy and I think it was transferred in to the US Navy as well. When I was the naval attaché in Washington I know the US Navy was looking very closely at it, but I'm a little out of date on what happened.

Another lesson learned. Plan early to be able to insert preferred and important systems into performance shipbuilding contracts or negative guidance shipbuilding contracts. I touched on that earlier and finally I took great interest in supporting Canadian industries and I think the Navy has to do that not only to ensure that we get excellent technology in the ships but of course to give Canadian companies the ability to compete in these areas.

INTERVIEWER: Well thank you very much Dennis that was a really good *tour d'horizon* of your time in DMEE and in your lessons learned you talked about the importance of doing something and in your other comments the lessons learned the word that came out in my mind

was leadership. It is the duty of senior officers in any organization to provide leadership and I think that's exactly what you did in spearheading or encouraging some of the initiatives, technical initiatives that our Navy has been quite famous for. So I thank you for that.

I wonder now if we could turn to your time as project manager TRUMP and your experience there.

REILLEY: Yes TRUMP, the Tribal Update [and Modernization] Program was a 1.6 billion dollar program, project that converted the DDH 280s into area air defence ships with enhanced capabilities across the board. It involved surface air missiles, long range surface air missiles. It involved close-in weapons as well against air threats. It involved infra-red suppression systems. It involved machinery, new machinery control systems, new NBCD control systems. It involved new combat control systems and indeed was a very complex program. In having done both TRUMP and, and the Canadian Patrol Frigate program I think that the TRUMP project, the TRUMP challenge was more difficult than building a ship from scratch because you had to take old ships with old drawings, outdated equipment, tear it all apart, integrate new systems not only into the ship but with other systems that maybe hadn't been developed as much as they should have been and was certainly a very great challenge.

Also we found..., okay let me step back, the shipyard chosen to do this was Davie Ship in Lauzon, Quebec and there were very difficult contractual problems between Davie Ship and the design agency which was Litton Systems in Toronto. Litton Systems was the prime contractor and they were responsible for producing all of the combat capabilities as well as managing the shipyard to do the work of converting the ship. The relationship between Litton and Davie Ship were not the best mainly because Litton was a high tech software company and Davie Ship was a hard and nasty boiler plate, steam, dirty type of environment and both very capable in their own domains but entirely different mindsets; so it was difficult.

Also I found, and this is *entre-nous* if you wish, that the Department of Supply and Services now called Public Works Government and Services Canada was very difficult to work with. On my staff I had, of course, naval engineers to keep an eye on things but also I had Public Works Government Services people to work the contract and I had Industry Canada, one Industry Canada person, to make sure the industrial benefits were flowing the way they should be. I found that the Public Works and Government Services staff tried to supplant or take over the DND engineers and start to dictate the overseeing capabilities and overseeing issues and this was difficult and it kept rearing its ugly head day after day after day and it was hard to suppress, but once you recognized it was happening you had to deal with it and it was quite easy to do.

Another thing which was quite interesting was trying to obtain the best up-to-date weapons systems. Litton had chosen for the air defence for the area air defence system something called CIWS, sorry I'll, I'll step back, not CIWS, Standard Missile Two, Block Two. In other words it was a missile called Standard Missile Two and the modification number, the model number was called Block Two. This was okay but it was not the most up to date capability that was available on the market and we had to buy these systems from the US Navy and they were very, they were very sensitive because these weapons had great capability and of course this technology behind

them had to be closely protected. Anyhow through some stick handling and some interesting work done in Ottawa, I obtained approval to upgrade that system from a Block Two to a Block Three which gave the missiles much greater capabilities and I can't mention them unfortunately because it's probably to this day still classified. Because we procured quite a few systems from the United States Navy the standard missile being one, the something called a close in weapon system being another we embedded, and in fact my predecessor had this arranged, embedded a lieutenant commander, an engineering lieutenant commander in the US Navy engineering section in Washington to sort of help the transfer of these equipments to the program. As I mentioned earlier SHINPADS and SHINMACS and SHINCOM were introduced into these ships.

One thing that I found, the naval staff attitudes were difficult and I'll mention this again in the Canadian Patrol Frigate program. I found that there was a feeling that the contractors were trying to do something for nothing or to put into other words were trying to do nothing for something. They wanted to make the most profit for the least effort and things were pretty difficult between the overseeing group, my group, the program office and the contractor because of that and I find and I found that you have to recognize that the contractors were chosen by the Navy, by the Crown as being the best company to fulfil the requirement and even though there will be problems and there always are problems in Major Crown Projects one has to assume that the contractor is 98, at least 98 % ethical and maybe 2% skating on thin ice and it's not the other way around and if you are not careful and if you get into the other mode where the contractors lying and cheating you every inch of the way it'll cost a lot of money to the Crown. It will delay the contract and I'm almost convinced positive that it won't give you any better product in the long term.

INTERVIEWER: Can I just interject here Dennis because I think you've brought up a very good point, this perception on the part of uniformed officers that perhaps the contract is, isn't always or contractor is not always above board. I've always been of the opinion and I'd like to know to the extent to which you share this perception or opinion on my part and that is I think a lot of the problems that we had with contractors was the ambiguity or the lack of specificity in our specifications and our contracts. In other words I think a lot of this fell back to the Navy's responsibility, but we were perhaps a little reluctant in admitting that.

REILLEY: Yes, often, I found that the Naval specifications were far, far too numerous and indeed one specification would conflict with another specification and that's where the problems arose. Too many fingers in the pie and not just over a period of a couple of months but over probably ten years and this led I think to a lot of this problem, a lot of the arisings if you wish and the so called animosity because the contractor wasn't doing as he was supposed to be doing. In some instances no doubt the specifications were understated and therefore open to interpretation, certainly on the software side of the house and that's something I'll get into a little later. Another thing that was of interest that I found was that the naval capability to really understand software on the TRUMP program particularly in the marine systems engineering was almost non-existent and we had to get on to getting naval people up and running on software and we accomplished this through the Fleet School Halifax and through something called TWIP, T-W-I-P, training with industry program which we instituted and got a bunch of young engineers, young naval officers into Litton Systems working alongside the Litton's employees. Litton could

use these people as their own engineers. These young TWIPs had no veto capability on any contractual matters or anything, but they learned the system and indeed they helped the company by bringing into their software development program a naval mindset which they didn't have at that time; very successful and I will highly recommend it for future programs.

The media was difficult. All sorts of terrible rumours that one of the ships undergoing contract had a bent keel, the Navy was incompetent, the Navy was incompetent and so on. I'll deal with media a little later when I talk about the Canadian Patrol Frigate program, but all of this provided me with a fair amount of heartache as it went along.

Lessons learned. Manage very carefully the program staff attitudes and indeed don't be afraid to shift people out of your program that you think are becoming too ponderous, too negative; it's a hard call but usually it's quite easy to detect when you see it. I think all program managers should have a media relations course and should work with the media and not avoid the media. As base commander in one of my other incarnations from '82 to '85 all base commanders at that time had to take a media relations course given in Ottawa and I had taken it and it stood me in very good stead when I was dealing with the media. However some of my superiors didn't think that anybody in the Navy should talk to anybody in the press about anything and that led to some heartache, but I'll talk about that a little later.

Let's see what else. Before taking over as program manager of TRUMP I'd never managed a thing in terms of procurement and I was pretty green. I learned pretty quickly. I would suggest though that there should be something akin to a program manager course available, maybe a one week course or two weeks, something of that nature available to senior Naval people involved in major procurement programs. Also I learned to stay very close to the Assistant Deputy Minister Materiel for whom I didn't work directly but he was the person calling the shots and anybody in between usually didn't get the story correctly down to me one way or another and at the time it was Admiral Ed Healey, very nice to work with, knew what he was talking about, he was an admiral, retired admiral, an engineer and we understood each other very well and had no problems. One last point, work very closely with the president of the prime contractor and with the president of the shipyard if the shipyard is not the prime contractor. Get to know him or her, understand each other's concerns and make sure that he understands your concerns as well as vice versa.

INTERVIEWER: Well thank you Dennis for that brief or very detailed but very good discussion of the TRUMP project. I'd like now to move to your time as project manager of the Canadian Patrol Frigate if I may.

REILLEY: The Canadian Patrol Frigate was a ten billion dollar program those are 1992 dollars to build twelve advanced frigates for the Canadian Navy. The main contractor was Saint John Shipbuilding, Saint John, New Brunswick and they were responsible for not only building the ship but doing the drawings, producing the production drawings, the ship's drawings and integrating the combat system capabilities into those drawings. The combat systems and weapons systems drawings and equipments and capabilities were designed by an outfit in Montreal called Paramax.

Challenges. The first week that I, after I took over the program I received a call from somebody from the press, I can't remember maybe it was the Globe and Mail 'Where's the first frigate?' and I was barely holding my head above water trying to get up to speed on the program and I said 'well it's not available yet, it's coming along very nicely' and so on, usual sort of platitudes and he said 'well you know five years ago it said the first ship would be delivered last week' and I said 'well, not ready yet'. He said 'well what's the matter?' Anyway you get the picture and I guess this led into all sorts of interesting excursions with the media over the two years that I was the program manager. While I think of it I think probably whenever the government gets into new shipbuilding programs and announces sort of the timeline it should be very, very wishy-washy as expressed to the media. Give yourself a big slush factor - after maybe about a year that the ship will be delivered between *such and such a date* and another *such and such a date* a year later.

Another challenge was my relationship with the Assistant Deputy Minister Materiel. It was very difficult, he was a very interesting person, a young man with no experience in naval procurement and very interested in advancing his career; very ambitious and somewhat averse to exposing himself to any sort of ridicule. I can understand that, but it was a difficult situation and something I had to live with. The staff attitudes of the program management staff I found to be difficult in some instances. Something that I called the 'iron major' situation or 'iron lieutenant commander' situation where a young lieutenant commander wants to make a name for himself; he may have a master's degree, he's certainly got an engineering degree of some sort or another degree - wants to be noted and therefore is going to do everything in his power to make sure that the prime contractor is shown to be incompetent. He the young lieutenant commander or major is the smartest guy on the face of the earth. You have to watch out for these guys and as I said earlier move them away if they become too vociferous.

The program called for Saint John Shipbuilding to build eight of the ships and four of the ships to be built by (six and six was it, oh, okay). I was corrected, six and six; six ships to be built by Saint John Shipbuilding and six to be built by Davie Ship. Yes I stand corrected in terms of the number of ships being built where basically Saint John Shipbuilding would build nine of the ships and three of the ships would be built by Davie Ship in Lauzon. So when you look at the Quebec yard it had the four TRUMP ships to rebuild plus three Canadian Patrol Frigates to build which sort of kept the Quebec side of the equation happy. So there were difficulties between Saint John Shipbuilding and the follow-yard which was Davie Ship. Saint John Shipbuilding was a little slow in producing some of the early drawings and Davie Ship took it upon themselves yet again to forge ahead with minimum drawings available to them and start building as quickly as they could. But eventually they fell behind and because the drawings weren't the best and Saint John Shipbuilding then undertook a major legal activity which I'll mention later.

I mentioned the media so I won't get into that again. Also there was a fight on between Saint John Shipbuilding and their follow-yard which is contracted to them, by the way, to be the only east coast naval shipbuilding capability extant after the program was finished. Then basically Saint John Shipbuilding, I think although it was never stated, would have been interested if

Davie Ship had gone out of business because they could then sort of be the only east Canadian yard with the capability. So that was part of the equation.

An interesting thing happened because of the so called slowness of Davie Ship, the construction. The lead yard, Saint John Shipbuilder Shipbuilding issued a stop work order on Davie Ship and sued them for 1.6 billion dollars in 1992 dollars, which is the largest suit of its kind in Canadian history. Davie Ship immediately got their lawyers going and convinced a local Quebec superior court judge to issue a temporary injunction to allow them to continue to continue working. This temporary injunction was a joke because I think it was in effect for at least a year and a half to two years. It was anything but temporary and it kept getting renewed and renewed.

Software production was a difficult situation; software production for the combat systems specifically, but also for some of the other software dependent systems and it's very, very difficult to specify software. You can specify capability of a particular system that it must have when it's completed, but how you get there is open to interpretation and it can lead to all sorts of interesting discussions, negotiations and so on.

Also progress payments had to be paid, the prime contractor. At that time the DND budget was being severely pressed and other departments and indeed other government departments and other parts within National Defence were eyeing my budget which was the largest of any such undertaking in the government. Indeed my budget was larger than many budgets of government departments. So there's pressure on skimming off funding from my progress payments to look after other so called priorities and this led to not the best atmosphere between me and the contractor, the prime contractor. Also the DND people in charge of sort of handling the budget, not my budget people but the overall DND budget - no I won't go any further in this particular vein because it's meaningless, I won't get in to it.

Okay finally there were settlement negotiations between the government, Saint John Shipbuilding and Davie Ship to try and resolve this 1.6 billion dollar suit and those are exceedingly interesting. Many government departments were involved in it. Eventually it was settled for somewhere in the area of about three hundred million dollars and everybody got back to work and were happy.

One thing I found which was a challenge that I really had no friends to talk to about some of the problems that I was undertaking, that I was experiencing. I was working directly for an Air Force engineer who knew nothing about building anything. He was a good guy but didn't know the business. He worked for ADM MAT who I mentioned earlier was a nice guy, but not very knowledgeable. My naval friends were all involved in their own business and really didn't have any time to discuss issues with me. The only person I could discuss issues with on an ongoing basis was the Director of Public Works & Government Services Canada, a guy named Andy Dumont. He and I shared offices across the hall from each other and he was the contract guy and even though we had our debates often at least we could discuss issues together and made me feel somewhat better.

Lessons learned. Hopefully there's an Assistant Deputy Minister Materiel who is fairly knowledgeable about the process and my advice is to stay close to him or her. Training with industry program was very good. I instituted it for the Canadian Patrol Frigate program as well and about 25 young naval engineers, officers located in Montreal worked alongside the Paramax engineers and provided the benefits I mentioned earlier. I mentioned working closely with the contractor's president.

Let's see let's turn the page here. Okay another one keep a credible interface with the prime contractor at the working level by a quote unquote "insider". A person on my staff named Huey Millman who was a civilian at that time, although retired Naval officer, was instrumental in allowing me to inject into the prime contractor concerns that I had without becoming contractual and likewise bringing back to me concerns that the contractor had without going contractual, and this was very productive, very, very productive in terms of when to decide to take the first ship, accept the first ship and so on.

Also ensure that the shore-based test facilities and the DND training facilities are well developed and keyed to deadlines. These basically are usually software oriented. They are facilities that allow engineers and operators to ensure that their systems are not only functioning properly but maintained properly and so on and indeed installed properly. Usually you find that the contractors shore based test facility usually becomes in the long run the Navy's training facility by taking the facility out of the contractor's building and locating it in Halifax or Victoria or whatever.

Ensure that there's an atmosphere of realistic and reasonable work-arounds. Often work-arounds become a major contentious point of contention and I think it's important to ensure that as a customer you don't demand the moon which is absolutely impossible, that it's realistic and so on. Also for legal reasons keep daily personal notes of discussions and meetings and so on. You may as a program manager be called as a witness some day in some sort of a suit and without this to refer to it could get very difficult for you.

One thing I found that helped with the press, with the media, was to show the ship to foreign navies as much as possible. One year after I became program manager the ship was not commissioned into the Navy, it had not been accepted by the Navy but was crewed by naval people. I'd made the decision and we'd worked this out to crew the ship with navy people but the person in charge was a civilian who happened to be a retired naval officer, a guy named Mike Duncan, but he had foreign going papers as a commercial captain and he was the so called captain. We took the ship down to Norfolk, Virginia tied her up alongside. There was some sort of an exhibition, a Naval exhibition going on, I can't remember the name of it, happened every two to three years and we invited all sorts of US Navy admirals and so on and foreign admirals on board, walked them around. Canadian press was invited; Peter Milewski of CBC you may recall was there - he's still active with CBC. After that date the media coverage was far, far, far less dismal, was far more upbeat because the press suddenly found out from foreign officers that Canada had a real winner and it helped immensely in getting rid of the negative attitude towards the Navy which had been dogging me for many months.

Now the program manager must get close to production and adopt a hands-on approach as often as possible. When I say hands on I mean get down walk around the ships, talk to the people developing software. Just go and meet people. Let the contractor see you and so on. I found that to be very worthwhile. Something that is expected and not always achievable is that the program manager will know every detail of every system and dimensions with the program as is humanly possible. I was often asked questions about all sorts of trivia by senior people in government and was expected to know the answers and it's very difficult. There's only so much you can deal with. I tended to focus on the big issues and when I needed somebody to provide the nitty gritty I would call in that person on my staff to fill in the details. But sometimes that was not always possible and led to some angst on the part of my DND superiors, but that's the way it was.

Yes staffing. At TRUMP I had about 50 DND people and about 20 Public Works & Government Services people on my staff. At the Canadian Patrol Frigate program I had 300 DND people and well over 50 Public Works & Government Services people working on my program. I consider that TRUMP was a more complex program than the Canadian Patrol Frigate and I mentioned this earlier and had many more challenges yet I found that the TRUMP program was easier to manage and much more visible to me in terms of all the little dips and doodles that go on in negotiations and what system is where and who is doing what to whom and so on and so forth. I may be wrong, but I think the Canadian Patrol Frigate was grossly overstaffed which not only cost money in terms of salaries, but I think cost money in terms of too many fingers in the pie.

Okay my last point is that I consider about 1.5 billion dollars in 1992 dollars and maybe over 2 billion dollars in current dollars, maybe even more than that, was spent in setting up the design and building infrastructure and the associated learning curve to develop the capability in Canada; to develop the capability in the shipyards and develop the capability of the software engineers, the weapon systems engineers and all the different contractors and subcontractors that line up. It's all gone now which is a shame because that capability at the time was world class, literally world class. The shipbuilding itself and the design and software and weapons capability in industry in Canada gone and that is a shame. I just hope that steady state shipbuilding becomes the way of the future and remains in place for many years to come.

INTERVIEWER: Well Dennis I think we've reached at least close to the end of our interview. It's been very useful; a very useful review of our technical history and our relationship, that is the Navy's relationship to industry, as told by you reflecting on your experience in four key positions that you held so I thank you very much for that on behalf, behalf of CANDIB and CNTHA. Would you like to make any further comments before we conclude?

REILLEY: Yes the only other point I'd like to make is that my career was not only engineering, I had several non-engineering appointments. As I mentioned I was vice commandant at Royal Roads, base commander at *CORNWALLIS* and director at the National Defence College and Naval attaché in Washington and I always found that those engineers that stuck strictly to engineering and disdained anything non engineering weren't quite as credible to the people who to this day I'm sure still call the shots in the Navy and that is the operators, the MARS people M-A-R-S, the people who drive the ships, captains, combat officers and so on. I

found that having had those appointments that I just mentioned gave me a measure of credibility and leverage with the so called leaders of the Navy that I wouldn't have had if I hadn't experienced them and it was most useful and I think helped me and indeed the Navy in the long run.

INTERVIEWER: On that note Dennis again I'd like to thank you very much for your contribution to this project and an interview, thank you again.

REILLEY: Good.

Interview ends

ABBREVIATIONS AND ACRONYMS

ADM (MAT)	Assistant Deputy Minister (Materiel)
ADM (PER)	Assistant Deputy Minister (Personnel)
CAE	Canadian Aviation Electronics Ltd
CANDIB	Canadian Defence Industrial Base project
CFTSD	Canadian Forces Technical Services Detachment
CI MARE	Canadian Institute of Marine Engineering
CIWS	Close In Weapons System
CNTHA	Canadian Technical History Association
CPF	Canadian Patrol Frigate
DDH	Helicopter destroyer
DMEE	Director of Marine and Electrical Engineering
DND	Department of National Defence
DRES	Defense Research Establishment Suffield
IR	Infrared
IRB	Industrial & Regional Benefits
LCMMs	Life cycle material managers
MARCOM	Maritime Command (Atlantic)
MARE	Maritime Engineering Officer Classification
MARPAC	Maritime Command Pacific
MARS	Maritime Surface and Subsurface Officer classification
NBCD	Nuclear Biological Chemical Defence
NCDO	Naval Central Drawing Office
NETE	Naval Engineering Test Establishment
NETTP	Marine Engineering Technical Training Plan
PWGSC	Public Works and Government Services
RMC	Royal Military College
SHINCOM	Shipboard Integrated Communication System
SHINMACS	Shipboard Integrated Machinery Control System
SHINPADS	Shipboard Integrated Processing System
TRUMP	Tribal Class Update and Modernization Project
TWIP	Training with industry program