



ORAL HISTORY INTERVIEW TRANSCRIPT

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INTERVIEWEE: Andrew McArthur

INTERVIEWER: Roger Chiasson

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Andrew McArthur

Interviewed 27 May 2010

By Roger Chiasson

Tape one Side one

Interview starts

INTERVIEWER: This is a Canadian Defence Industrial Base or CANDIB Oral History project interview with Andrew McArthur that was recorded in Halifax, Nova Scotia on the 27th of May 2010. The interview was conducted by Roger Chiasson. Both participants have signed the copyright release form. Andrew McArthur was the President of Saint John Shipbuilding Limited or SJSL from approximately 1975 to 1985 during the crucial early days of the Canadian Patrol Frigate or CPF project leading up to contract signing. Mr. McArthur has a unique insight into the company's response to the first Canadian Naval turnkey procurement in which a prime contractor assumed responsibility for the design, construction and integrated logistic support for a complete class of war ships. Later in 1985 Mr. McArthur became the President of Halifax Dartmouth Industries Limited or HDIL and held this position until March of 1994 during the construction of the Maritime Coastal Defence Vessels or MCDVs. The MCDV project was the first Canadian Naval project to include in-service support as part of the main contract. Mr. McArthur has a unique global perspective on the MCDV project. So first Mr. McArthur I'd like you to start this interview by asking you to give us a brief biography of yourself including your introduction to shipbuilding, your education, how you came to Canada and your experience in the industry leading up to your employment as President of Saint John Shipbuilding Limited.

McARTHUR: Andrew McArthur speaking. I was born in a town in Scotland called Kirkcaldy, Fife just north of Edinburgh and attended Kirkcaldy High School and I joined Burntisland Shipbuilding Company as an apprentice craftsman in I believe June 1952 where I served a five year apprenticeship during which time I did an Ordinary National Certificate in Naval Architecture and Higher National Certificate in Naval Architecture and got distinction in all subjects. I then attended King's College University of Durham in Newcastle England, sat an entrance exam and was admitted to the second year and completed a Bachelor's Degree in two years and did a further year, got a general degree in Naval Architecture in 1960 if I remember correctly. Thereafter I worked a short time and during college vacations, short time in various shipyards on Tyneside, Swan Hunters, Vickers, Hawthorn Leslie's and I joined Hawthorn Leslie's after graduating from King's. Only stayed a short time and then I went to Odense Staalskibsværft in Denmark where they had built a brand new shipyard at Lindo on the island of Fyn and went there as a naval architect and it was a brand new shipyard. They were building the first ship in the shipyard which was a 35,000 ton tanker for Chevron, and at that time we felt nothing could ever be bigger than this, it was absolutely massive. It was an excellent shipyard and I stayed there until the end of six..., we were there two years left in December '62 to start work in Saint John in 19 January '63.

I basically came to Saint John because Standard Oil formerly owned the ships we were building in Denmark and it was through them I came to Saint John Shipbuilding as they stated to me at the

time the shipyard was in a hell of a mess and could use good people so I came to Saint John. Started work in January '63 in the production planning department and remained there for some time and then the General Manager at that time died very suddenly. Then after that I became Outfit Superintendent and after that Naval Architect and then a Technical Manager and subsequent to that Technical Manager and Director of Sales.

At the time we bid for the PROTECTEUR and PRESERVER, I was Technical Manager and I believe the bid was around 1964 and it was a very large contract, two vessels and if I remember correctly the price was about 64 million which was the largest contract the Navy had ever given out at that time for the construction of ships. There were two bidders for the PROTECTEUR and PRESERVER, Davie Shipbuilding in Quebec and Saint John Shipbuilding and fortunately we were the winner. It was a great contract to get. Basically the design had been done by the Naval Central Drawing Office at the time and that was controlled if I remember correctly by Captain Tom Maxwell and so we had a basic design to work with. After we were awarded the contract we had, at that time, we had three months to change it accept the design or come up with any discrepancies you found and if I remember correctly we found in a sea state five that the ship in fact was unstable. This was quite a surprise to the government but our calculations proved to be correct and it was difficult to find a solution. The final solution was that we would put a double bottom with a tank top at certain centre tanks with oil fuel in these centre tanks would remain there as permanent ballast only to be used in an emergency. This of course was a better solution than adding permanent ballast and any other form so that was the first design change and that was negotiated I forget, the cost of that but it was negotiated and we started to build the ships.

There were problems with the ships basically things went along quite well but one of the major problems was that in fact the contract had been stated to be a commercial contract and everything would be built to Lloyd's Register of Shipping rules which it started off with, but very soon thereafter the government introduced their own inspection services and we had many instances where Lloyd's would inspect a steel unit, mark up the corrections they wanted then afterward the Navy would come along and mark up everything they expected over and above Lloyd's. So the company had a difficult decision to make at that time. It would stop work and just try and settle it then and there. We talked to the government at the time and said okay and they talked to Mr. Irving the owner of the shipyard and he said we should carry on. Tell the government we're going to carry on, we object to this and we expect to be recompensed if there is, if it is shown that you know we in fact were correct and the government is wrong so basically that's what we did and carried on, we adhered to the additional work the Navy required.

INTERVIEWER: And was Saint John Shipbuilding compensated for, for the work that the Navy insisted over and above Lloyd's classification standards?

McARTHUR: Eventually and that's where this story is going.

INTERVIEWER: Thank you, sorry to interrupt.

McARTHUR: No it's okay and we carried on and we had a good relationship with the Navy. Things basically went well. There was the normal give and take on things, but overall it was a pretty good contract and the ships were delivered and I think time has shown to be excellent ships. In fact we're sitting here today and they're still in business long after their useful design life. The fact was that we had a big argument at the end of the contract and couldn't come to an

agreement with the government regarding additional compensation. It went to court and the government refused to pay and it was going to the Supreme Court and eventually walking up the steps going to the Supreme Court of Canada it was finally settled, the government saying we will pay, long time, money, time wasted. There has to be a better method of settling disputes. In fact if I remember there was another step in between, the Contract Settlement Dispute Board or something.

INTERVIEWER: I do recall that certainly later there was a contract resolution system in place, I'm not sure whether in fact in the late sixties it was in place but it could have been for the lack of some sort of arbitration system that it went as high as the Supreme Court.

McARTHUR: But anyway it ended up in court, and that's where we finally got what we think we were entitled to.

INTERVIEWER: Now having, having said that and, and looking back on it were in your opinion the Naval additions, the belt and braces just that, belt and braces or, or was there any rhyme or reason and, and the fact that the ships outlasted their useful, predicted useful life would that be in some measure due to the additional standard that the Navy imposed granted at the time contrary to the contractual arrangement.

McARTHUR: I don't think anything they imposed extended the useful life of the ships and a lot of the argument was about hull structure and I don't think that really, they didn't increase the thickness of plates or stiffeners or anything. It was about a weld... so called welding defects if I remember correctly and alignment and whether a distortion of the plates and that was all set out and we just wanted over and above really what was set out. That was our argument.

If I could make one comment on that we are sitting here today in 2010 and we're discussing Arctic Offshore Patrol Vessels. The first public conference that the government held explained that we were going to build Arctic Offshore Patrol Vessels. To get up on the platform and say they will be built to commercial standards, I asked no questions of that but I made one statement that I will reiterate here again and I said, "I hear you, I understand you. The sad thing is that not one person on this stage today making this comment understands commercial standards. The only thing you know of is Naval standards and if you tell us commercial standards and we bid on that and we go through the same build we'll end up in the same situation as we did with PROTECTEUR and PRESERVER." So that's my only comment.

INTERVIEWER: And I would say probably a fair comment in retrospect then.

McARTHUR: Yes.

INTERVIEWER: It will be interesting to see how it turns out.

McARTHUR: It will. We're still waiting to see yeah. But apart from that you know the relationship between the company and the, the government, the whole government, the Navy and I think it was DSS, Department of Supply and Services at the time it went on quite well and both ships were delivered and like I said have given extraordinary service to the Navy.

INTERVIEWER: Good. Well thank you Mr. McArthur. And now if we could go in to that phase in Saint John Shipbuilding when I believe you became President in about 1975 and talk to us about

the introduction of the Patrol Frigate project because you were there for the crucial first few years.

McARTHUR: CPF, Canadian Patrol Frigate program, very interesting program and very extensive. It was the first program I believe where the prime contractor would have total system responsibility and initially we looked at many, many years before the contract was signed. The contract was finally signed in I think it was June '83. It was '83 and I think it was in June I forget the exact month and we talked about frigate replacements for probably ten, twelve years before that. I first visited, it was called Sperry at the time who was going to be potential partners with us and I visited Sperry in fact I remember saying on the day the contract signing the first meeting I had with Sperry down in Great Neck, New York was seven years less four days before the contract signing; so we worked on that program for seven years but we talked for many years before that. So Sperry and we decided to get together and in the initial stage Sperry was going to be the prime contractor and Saint John Shipbuilding would be the subcontractor to, to Sperry and that went on for a number of years and then it was thought - is that the correct thing to do? I forget exactly the time, but a couple of years went by, we were always in discussion with the government about how to proceed with the program and it became very apparent to me that the Canadian Government was not happy that the prime contractor was going to be an American company so we talked about it. Sperry were quite happy to go either way. We talked to various people in government and it was decided, I spoke to Mr. J. K. Irving the Chairman of the company and we decided it would probably be better if Saint John Shipbuilding became prime so that was the end result. Saint John Shipbuilding became prime and Sperry were the major subcontractor and the combat system integrator.

INTERVIEWER: Now it's always been my impression that Sperry who eventually became Paramax for the Patrol Frigate Project had its nose a little bit out of joint but you, you said here that Sperry could, could go either way. It's quite an interesting perspective because I think most of us who weren't directly involved are under different impressions.

McARTHUR: No I talked to the various senior people at Sperry and explained the situation to them that you know if it happened in the States it would be quite unacceptable that the prime contractor was a Canadian company and were going to build ships in the States and the senior people certainly understood and they said you know that's quite acceptable, we understand where the Canadian government where you are coming from and our share is going to basically be the same which we said yeah your share is basically going to be the same so the senior people at the time were certainly quite acceptable and I must say I for one never detected any animosity at any level with Sperry's, nose put out of joint so to speak because we had become prime and they were..., all the way through Sperry were very supportive of us.

INTERVIEWER: I think you probably know I, I was overseer of the Patrol Frigates a few years later when Paramax was of course the major subcontractor at Saint John Shipbuilding and I think it's at that time that the tensions developed because let's face it the Combat Systems was even more of a departure from, from normal practice, procurement practice than it had been in the past investing total systems responsibility in a major subcontractor like Paramax with a shipyard who in the eyes of Paramax maybe didn't know enough about the combat systems and the software part of it so I think there were some definite tensions there but that, that would be expected even if the roles had been reversed I think.

McARTHUR: Well that's a fair comment and I think there were tensions at the you know who did what to whom and the, the combat systems as you know Roger is very, very complex and millions of lines of...

INTERVIEWER: Code.

McARTHUR: ...code for computers and it took longer than expected in a lot of areas. Did Sperry live up to their end of the bargain? In the end, yes. I mean did Saint John do everything on time? Absolutely not. There's always hiccups along the way but over all and it was Paramax, as you say Sperry subsequently became Paramax then became Unisys then became Lockheed Martin. So it's been a whole evolution and, but overall we had a very good teaming arrangement, good rapport with Sperry-Paramax and it went along quite well.

It was a very interesting time and basically we were going to, the original contract was for six ships with an option for six but the first contract would be for six and it was pretty evident that, that had to be divided up; probably three in Saint John and three in Quebec and this in fact was the two month delay in contract signing until the split up had been agreed, three in Saint John and which yards in Quebec would be doing the work. It eventually changed anyway and Davie Shipbuilding did all the work in Quebec. But Davie did nothing, the option for six was eventually exercised by the Canadian government and Saint John built all six, which made much more sense than splitting them up.

INTERVIEWER: So now I wonder if we could backtrack a little bit Andy and get you to talk about the contractual aspects of the Patrol Frigate project. It was after all a major departure from, from previous procurement practice.

McARTHUR: It was a very interesting contract and the fact that as you said to give the prime contractor total system responsibility was something new for the Navy, the government and very much so for industry. For before this had never happened. The government had retained certain system responsibility under their control so it was a complete departure and this made the contract negotiations quite long and interesting and for the shipyard as, as prime contractor of the game how do we price total system responsibility. Putting a price on the ship is easier than putting the, on the contingencies you must allow for total system responsibility etc. So contract negotiations including price negotiation went on for quite a long time and in the end it was agreed with the government that we would have a base price and a ceiling price that we and the government negotiated together and between the base price and the ceiling price there was a target price and there was an incentive to come in, if above the base price certainly below the target, and once you hit the target price then there was a cost sharing and I forget exactly the distribution but government paid part of every dollar the prime contractor paid part of every dollar until you hit the ceiling price, then if you went over the ceiling price the company was on its own, so thankfully we never reached the ceiling price and in the end the contract I think worked out pretty well for both sides, both parties.

INTERVIEWER: Andy it strikes me that this whole process of negotiating a total systems responsibility base price target price and ceiling price was a very, very significant exercise in risk management for both Saint John Shipbuilding and the government. Would you, would you like to talk about that a bit?

McARTHUR: Sure, there's not really much I can say about that, it was a negotiation thing. It was recognized by all parties, government all sides of government, DND, DSS, Sperry and ourselves that if we were in fact going to manage this contract the way it should be done that huge attention had to be paid to risk management and it was a huge learning process. Sperry probably had more experience in risk management than either of the other participants. For I mean you pick Saint John basically we'd been building commercial ships and we had a quasi ship risk management but it was a pretty ad hoc arrangement that was not very sophisticated and it was recognized that we had to install a first class excellent risk management system. We did rely quite a bit on Sperry at the time with their experience at risk management just to how to set it up and it was set up. How did it work? I think we have to say it worked reasonably well because in the end the ships were delivered on time within budget so the end outcome was quite good.

INTERVIEWER: Now this, this I'm not sure if steel was first cut on your watch or not but I know that one of the, one of the lessons learned that's come out of the patrol frigate project which I don't think anybody would argue with is the fact that steel was cut too early especially with all of the design changes that take place early on in the detail design especially with follow yards that have to follow the lead yards. Did that start happening on your watch or are you familiar with that and would you corroborate that or would you have any other comment?

McARTHUR: I would agree it was cut too early but it didn't happen on my watch. We signed the contract June '83. I left in January '85 and no we had not started cutting steel for, we were still at the..., that's only eighteen months after - well a bit more, and we were still in the engineering phase.

INTERVIEWER: Well Andrew, Andy I'd now like to switch focus to the Maritime Coastal Defence Vessel project most of which I believe you were during which you were the President of Halifax Dartmouth Industries Limited and I'd like to discuss this on a number of fronts but I'd like you to start with the contractual arrangements, what were they, what was the relationship between the prime and the subs and this business of turnkey total systems responsibility, I think existed in the MCDV project as well.

McARTHUR: Yeah. Okay let me just say something to start with that I left Saint John in early '85 and late '85 I put a group together and we bought the Halifax Dartmouth Shipyards and called it HDIL so as well as part owner I was President and CEO and ran the company which I must say was one of the most enjoyable times I had in the industry. Come to Maritime Coastal Defence Vessels, MCDVs, and we won the contract and quite interesting we beat Saint John Shipbuilding. They were one of the participants. That was a lot of satisfaction but when we started it we wanted to bid on it and I went to Ottawa and visited, now it's PWGSC today and I forget what it was, if it was still that.

INTERVIEWER: It is. I think it was Department of Supply and Services.

McARTHUR: It was still DSS at that time, talked to a Director up there who I knew quite well and he said Andy there is no way you can meet the financial commitments to be prime on MCDV. He was absolutely quite correct. I mean we did not have the financial wherewithal so I had known Bernard Lemaire who was the President of Lavalin quite well and Bernie Charbonneau who was an ex-government employee who worked with Lavalin at that time so I went to visit them and we talked about it and it was put on the table that Lavalin was a big strong engineering company

financially strong and poor little HDIL didn't have enough money why don't Lavalin be prime and we will be the subcontractor and the agreement was as shipbuilders we would build the ships, we would do the design and we would do all the procurement and they would be overall management as prime contractor and that made quite a lot of sense because as well as HDIL we owned German Marine Limited which at the time was probably the biggest Naval Architect company in Canada. It was the ex-German and Milne company and we bought and renamed it German Marine and moved it to Dartmouth so they would be the designers so that was agreed and we carried on and Bernard Lemaire and I spent a fair time in Ottawa promoting this consortium of Lavalin HDIL. We were actually in contract negotiations when what I thought was big strong financial Lavalin, Lavalin went bankrupt and to cut a long story short SNC stepped in and bought Lavalin and became SNC-Lavalin. They were the prime and HDIL was the shipbuilder so the agreement remained intact and it worked quite well. German Marine designed the ships which I think the design has been very successful. We built the ships and it was a very successful program.

INTERVIEWER: I just have one question again about this total systems responsibility, there's an awful lot of integrated logistics support involved in, in this, this type of contract. Was that primarily a Lavalin, then SNC-Lavalin, responsibility or was that HDIL?

McARTHUR: It was both, they were both involved and they as SNC-Lavalin they were very good, very capable company and we had a very good relationship with them so it actually went very well. These ships again I think have been very successful for the Canadian Navy still operating and overall the contract I think went, went well.

INTERVIEWER: Can you talk a little bit about the project management organization how, how many people did you have in SNC-Lavalin and more specifically HDIL in managing the project, rough order of magnitude as a basis of comparison Saint John Shipbuilding had about a thousand people for the CPF project. It wouldn't be anywhere near that big for the MCDVs, but can you talk a little bit about that.

McARTHUR: Roger to the best of my recollection SNC-Lavalin maybe had four or five people in Halifax. I think if it topped out at thirty or forty it would be no more than that. These were not big sophisticated ships. They were generally quite easy ships to build. There, there was nothing really major that required a lot of preplanning. I mean we were quite accustomed to building ships of that size and it was not a difficult task.

INTERVIEWER: Now these MCDVs were they built to Lloyds or similar commercial standards?

McARTHUR: To my recollection yes and I don't think we had any great difficulty on these ones because they were basically small ships and didn't receive as much attention maybe from the government side as CPF and PROTECTEUR and PRESERVER.

INTERVIEWER: So going back to what you said earlier about the Arctic Patrol Vessel perhaps this experience bodes well.

McARTHUR: Hopefully correct, you're correct.

INTERVIEWER: Can you talk a little bit about the relationships between the various players PWGSC and I think you've already spoken a bit about the good relationship between yourself and the prime, but DND, PWGSC and the shipyard.

McARTHUR: Actually on that contract we didn't have really a great deal of difficulty again maybe because it's a more simple contract but the relationship, you always fight. There's always discussions, arguments but we found ...overall the government overall you know handled themselves quite professionally. There's the odd exception and I'm sure it's the same in industry. We think we, our people handled it well but there's always the odd exception.

INTERVIEWER: Well can you talk a little bit about the frustrations and the challenges that, that you met. What did you fight about or what did you disagree about because you know they tend to change a little bit between projects but sometimes the story sounds the same but what was your experience?

McARTHUR: To my recollection the biggest arguments would always be have you made milestones and for a company that's crucial. You don't get paid if you don't meet the milestones and always arguments about meeting milestones and apart from that I wasn't here at the end of the program of course and oh well I was again back. I can't remember a lot of big arguments, real frustrations.

INTERVIEWER: As you say this was a pretty straight forward, you were really responsible for the platform i.e. the ship....

McARTHUR: Yes.

INTERVIEWER: ...systems. I think the MCDV project initially had a number of different platf... or payloads that were planned for the ships but were you and SNC-Lavalin involved in that part of the project or not?

McARTHUR: Yeah but the payloads that was all done right up front contractually and there was a discussion which ship would have payloads, what would it be and how much money it was. And if I remember the agreement was that only the first two vessels would have minesweeping gear for example and the rest would be fitted for but not with and I don't think there was much discussion. There was other payloads which were made up of containers and it was just a case of putting appropriate connections on the vessels so that if and when a container was required you put it on the after deck.

INTERVIEWER: But your responsibility as, as a shipbuilder and, and yourself and SNC-Lavalin was to build a platform for but not with after these payloads?

McARTHUR: Correct.

INTERVIEWER: Okay.

McARTHUR: Again that turned out to be good contract – delivered on time and budget – and it's quite interesting I think for you know the normal perception seems to be every program was always over budget and always late. I mean you've got two significant programs there - the biggest and another major one - both on time and on budget...so.

INTERVIEWER: Good, well we've talked about the challenges and the frustrations about which there were a few which is good to know. I wonder if we could now dwell on the major successes and achievements in the MCDV project in general and HDIL's contribution to that.

McARTHUR: I think the major achievements were the number one we got the design correct right up front. There were to my recollection not a great deal of design changes, there was a lot of discussion with Navy at the time and get the design correct, get it the way the operators wanted it and I think that's probably one of the achievements. It was a fairly mature design when we started to build it and get rid of all the discussions, arguments etc right up front.

INTERVIEWER: If I, if I could just dwell on that for a minute, were you and German Marine presented with a preliminary design or were you basically working from a clean sheet of paper?

McARTHUR: We were working from a clean sheet of paper and in fact if I remember correctly they were going to be minesweepers and I remember, I went over to the U.K. and talked to the Navy there and they had a minesweeper called the River Class and we negotiated to get the rights to build the River Class in Canada for the Canadian Navy. Subsequently at later glance we found the River Class was not quite what they required but we did have information on it, and it probably gave us a good introduction to minesweeping and minesweeping technology and how to go about it but we basically started with a clean sheet of paper.

INTERVIEWER: And what were the weaknesses in the River Class design? Was it seakeeping primarily?

McARTHUR: You know I'm trying to remember. Typically in Canada we all have requirements that no other Navy does.

INTERVIEWER: Very true.

McARTHUR: whether it's on Frigates, JSS or any other we always have requirements peculiar to Canada and I honestly forget which one it was but we felt that it wasn't really a suitable design to meet the Navy requirements and why I don't remember.

INTERVIEWER: Now the reason I ask that question and, and ...is the fact that these ships operate in pretty hostile...

McARTHUR: Yes.

INTERVIEWER: ...North Atlantic waters and obviously on the west coast as well and therefore seakeeping I think was a very important factor.

McARTHUR: Yes.

INTERVIEWER: and, and I honestly don't have first hand experience or any, any reports but I think they probably met that requirement quite well.

McARTHUR: Oh one thing comes to mind if I remember correctly the River Class were conventional drives and the requirements of the Navy for example mapping the bottom of Halifax Harbour you need total manoeuvrability and control so we decided to go with two aqua., two pods totally reversible can rotate through 360 degrees which gave them twin screw which means you can make that vessel turn on a dime, dime, and if I remember that was one of the criteria we decided against it.

INTERVIEWER: So I guess it's fair to say that if the Navy or part of the success is that the Navy described the requirement well and you were able to respond to it because had they not asked for that kind of manoeuvrability or seakeeping it would have been perhaps a different design.

McARTHUR: Yeah I think you're absolutely correct that, that's a fairly fair assessment. One other aspect comes to mind was it was a very sophisticated control system for the command and control and the engines and everything and one of the reasons I think that was required by the Navy was these vessels were going to be operated by Reserves and used as training vessels so if it just had a simple engine control system, the master pulls the telegraph on the bridge that somebody had just sent that wouldn't really be suitable, the Navy required for training the reserves so it did have quite a, for a small ship it had a very sophisticated system.

INTERVIEWER: Well I think Andy we're getting close to the end and you know, you talked a little bit about the Arctic Patrol Vessel that's coming on stream somewhere in, in the next future little while and we talked about, I think we hinted at similarities between the MCDV project and the Arctic Patrol Vessel. Are there some lessons learned from the MCDV project that could be carried on into the Arctic Patrol Vessel or any other similar contract?

McARTHUR: You know I think the lessons learned are get your requirements defined clearly and specifically right up front so that both parties, you the government and the contractor, are totally aware of what is required. Most of the arguments come in my experience from ill defined requirements. Somebody writes a requirement, we interpret it one way, the guy who wrote it meant to say something else and the lessons learned I think get the contract clearly defined, both parties understand it, get the requirements clearly defined and both parties understand it, then a lot of the problems disappear.

INTERVIEWER: There is a nuance about defining the requirement that I'd like your, your comment on, 'cause to me there are two ways of defining the requirement and going back to the way we used to contract out shipbuilding we, we decided that is the Navy you know the size of the nut and bolt...

McARTHUR: Yes.

INTERVIEWER: ...and every finite detail but we've eventually, we've evolved over time to this total systems responsibility. This is what the ship must do, these are the environment...

McARTHUR: Yes.

INTERVIEWER: ...that the ship must survive in. So would this be a lesson learned in your opinion? In other words and I'm not trying to put words in your mouth but I think most contractors would be happy to say tell me what to do, don't tell me how to do it.

McARTHUR: It can go both ways and you know as long as the government understand what each different way is there's no point in saying you've got total system responsibility and when the company then says okay this pump meets that performance specification set out in the total responsibility, somebody from the Navy coming along saying yes but I would like it to do this whatever this is. Well this could be totally different from what the, the original intent that the company saw and if it's come back if it's not clearly defined and if the Navy want this whatever that may be. Somehow it has to be in there so the company is aware of it and we get the argument well it's a Naval ship buy off the shelf pumps not a problem for industry buy off the shelf pumps, then you find an obscure specification somewhere buried in some other specification that, that pump requires to be shock resistant. Well specifications doesn't say that but if you go through specification one to number two, to three to number four somebody might

say well it does say it a way down here buried in the weeds. That's not good enough and don't come along to the contractor and say well if you'd gone through all the specifications you get to page 999 you'll find that shock is required and if the main specification doesn't say it out loud quite clearly you're going to have an argument.

INTERVIEWER: I think you've expressed the truism that there has to be a clear requirement but what I think you're saying also is that both parties have to be, have to have a mutual understanding of what that requirement means.

McARTHUR: Absolutely.

INTERVIEWER: And that's not always the case.

McARTHUR: No, but if both parties don't you'll end up with arguments.

INTERVIEWER: Andy I'd like to thank you very much for this time we've spent together talking about your experiences over three very significant projects for the Navy and in industry and on behalf of the Canadian Naval Technical History Association and CANDIB again thank you very, very much.

End of tape 1, side 1

Interview ends

ABBREVIATIONS AND ACRONYMS

CEO	Chief Executive Officer
CPF	Canadian Patrol Frigate
DND	Department of National Defence
DSS	Department of Supply and Services
HDIL	Halifax Dartmouth Industries Limited
JSS	Joint Support Ships
MCDV	Maritime Coastal Defence Vessels
PWGSC	Public Works and Government Services
SJSL	Saint John Shipbuilding Limited
UK	United Kingdom