



**Oral History Interview Transcript**

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**Interviewee: Commodore W. J. Broughton (Ret'd)**

**Interviewer: Gordon Smith**

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**Transcribed by: S. Mohamoud**

**Transcription of Interview Number: 7-C12****Commodore W. J. Broughton (Ret'd)****Interviewed 4<sup>th</sup> January 2007****By Gordon Smith**

INTERVIEWER: This is a Canadian Defence Industrial Base interview with Commodore Bill Broughton on the DDH 280 Destroyer Program. The interviewer is Gordon Smith and he is assisted by Doug Hearnshaw. The interview is taking place in the home of Bill Broughton. Tape one side one.

Bill could you give us some of your resume, of how you got into the Navy?

BROUGHTON: Certainly, yes. I went to Royal Roads [Military College] in 1953 and spent the two years there. Then on to RMC [Royal Military College] in Kingston where I [took] mechanical engineering. In those days we had to complete it at a University-they weren't giving a degree at RMC, so I went to Queen's. At that time I wasn't sure if I wanted to stay in the Navy as a marine engineer, but I became aware of the opportunity to take naval architecture, which did interest me greatly, so I applied and went to MIT where I received two degrees. (Post-graduate degrees in naval architecture and marine engineering). From there, I started my real naval career, if you will, initially on the Hydrofoil Project, then the 257 Conversion [followed by] time in Halifax dockyard in engineering, and then back into the ship design offices here in Ottawa. It was at that time, after a tour in Staff College, that I entered the 280 program, and afterwards, of course, I had a number of other appointments, retiring as the Director General Maritime Engineering and Maintenance in 1990. So in short, that was my career.

INTERVIEWER: Yes, but when did you get involved in the DDH 280 Program?

BROUGHTON: In 1968, at the end of Staff College, I came back to the Engineering Division here [Ottawa] and I was assigned initially under Commander Ross Morgan in Central Systems Engineering. I had a little bit of association but nothing direct. And then LCdr Fred Nicholson retired from the [DDH] 280 Technical Office and I was moved across – at that time it was about January 1969 I believe – to replace him. So, Commander at the time, Larry Wilkins, was the Project Systems Engineer (PSE) 280 which was the central technical office for the program in the engineering division and I was his number one man, primarily responsible for the specification.

INTERVIEWER: Did you get involved with any of the design or were you in, sort of, the system engineering...like PSE?

BROUGHTON: Well no, we were certainly involved in the design. At that time, the preliminary design had been completed and that was what was contracted out to industry. But then you had to go through the business of preparing detailed drawings for the shipyards. This was done at the Naval Central Drawing Office [NCDO] in Montreal, which was really a part of Canadian Vickers Limited. But, under the arrangement of this program, the Marine Industries Limited in Sorel, Quebec, which was the lead yard, they actually had the contract with NCDO. And then there were separate contracts with the government to the two shipyards – Marine Industries and the other one, Davie Shipbuilding in Lauzon, Quebec. So, the two shipyards were each to build two ships and the drawings were to come from NCDO. The specification to which those drawings were to be prepared was under our control in Ottawa, so that's how we in effect controlled the design.

Now, I am talking here about the ship, I am not talking about the design of combat systems or marine systems or auxiliaries machinery systems. These were under the other technical sections within the Director General Maritime Systems, which is where our office was located. So, it was, quite frankly, an

awkward arrangement, because if you take, for example, the main propulsion plant consisting of gas turbine, gear box, shafting, and propeller, [it was the responsibility of] a separate section within Director General Maritime Systems and Prime Movers, under the Director of Maritime Electrical Engineering (whatever, I can't remember). [correctly, Director of Marine and Electrical Engineering]. Anyway, they had a separate contract with three different people: They had one with Canadian Pratt and Whitney Company for the gas turbines; they had a separate one with Maag in Switzerland for the gearbox, and the third one Lips Propeller Works in Holland for the controllable pitch propellers. They had the responsibility, this Prime Mover section in the technical office, of pulling that together and they in fact did that and ran their own shore tests down in Philadelphia before this stuff was delivered for installing in the ship. Now, when it came to installing in the ship that's where my responsibility became involved, because we had to give direction to the Naval Central Drawing Office about what the requirements were for putting these things in the ship.

INTERVIEWER: I've got a question for you there, Bill; I don't understand when you're saying they had three or four different contracts. I understood it was United Aircraft Company, which is Pratt and Whitney now; they had a contract to supply the whole propulsion system.

BROUGHTON: Well, I may be wrong there. There were three major suppliers, so the other two could have been sub-contracts.

INTERVIEWER: Yes there were, the overall contract was with UACL, which is United Aircraft [of Canada Limited].

BROUGHTON: Well, thank you for correcting that. My main point is, though, that one of the problems that resulted is that there was a large amount of government supplied material [GSM] such as the propulsion plant, such as the gun from Oto Melara, such as radars and so on throughout the ship. One of the difficulties was, just to talk about the prime movers thing, is in order for the Naval Central Drawing Office to put together the drawings to give to the shipyard, they needed to know what those gas turbines looked like, what cooling water, hydraulics, what electrical control, what the footprint was to mount it, all of this – technical information – so that they could say 'it was this big' and 'it attaches this way' and you have to 'connect this thing to it' in order for the thing to run. Well, they didn't have a requirement in the GSM contract for that gas turbine [contractor] to provide it, so there was NCDO wanting to put the shipbuilding drawings together – and we're talking about hundreds of equipments – and if it were something coming off another contract generally speaking the technical information to do that was not required as a deliverable off the contract. So the poor draftsman at NCDO went down to the supply depot and started measuring things in order to complete it. [the drawing] As a result there was a great delay in generating the drawings. And, of course, the Crown was saying "M.I.L it's your contract with the Naval Central Drawing Office, so get them to do the things they need to do and get us the drawings so we can build the ships because we're losing money...or the cost is escalating", if you will. Whereas they were saying to us "but that's GSM [Government Supplied Material] that you, the Crown, are supposed to supply to them, so why don't you solve the problem?" And it was as a result of that kind of conundrum that they [National Defence] in fact established a large, much larger, program management office to get on top of this major problem. Because, in my opinion, the greatest risk in putting together a ship is managing the technical information to do it. It's not selecting the gas turbine, it's not designing the hull, it's the technical detail in order to fit all that stuff in the ship so it will work. So, it was a very, very, you know, unusual event. It was not the way we did it the first time and it was not the way we did it the next time, with the Canadian Patrol Frigate, but it's what we did with the 280 program.

INTERVIEWER: That's very interesting Bill. Now did you get involved with the contract, the overall

contract, for the construction? I guess it was the contract with the shipyard. Did you get involved with that?

BROUGHTON: Well, in some ways yes, and in a direct sense, not really. First of all, as you know, the contract itself is not the responsibility of the Department of National Defence, it's the responsibility of the Department of Supply and Services. So they had a contract officer, and he was responsible for the contract, but in order to monitor / execute...whatever...the contract, they relied on National Defence for their technical assistance and in that sense, yes, I was involved. In fact when I first went on the 280 program, Larry Wilkins, a commander at the time (he retired as a Commodore) said, "Would you take a look at the contract, Bill, because we are having these difficulties with costs going up, and see what the kind of problems are". Well, I was looking only at the ship contract for the shipyard, not the contract to the drawing office and none of the government supplied material contracts, just the contract between the government and the shipyards.

Well, one of the interesting things was that they [the Crown] basically had completed what I would call a Preliminary Design; and, by that classical definition, a Preliminary Design is that the major equipments and features of the ship have been decided – how big it is, how fast it will go, what kind of propulsion it'll have, what kind of armament it will have. But it was not as far as what we would call a Contract Design; and, a Contract Design means that you've produced enough drawings and enough technical detail and specifications so that a shipyard can basically make a firm bid on the contract. It was kind of half way in between. Some parts were fairly detailed and others were wide open. Now I'll give you an example. They'd actually at NCDO, for the purposes of what went into the contract, produced some air conditioning and ventilation drawings. Even though the final arrangement of the ship hadn't been decided, so you didn't know exactly where all the compartments were or how big they were or what their cooling or air conditioning requirements were, but they had said, "well, we'll have the main units here and distribute it generally throughout the ship there"...including actually drawing some ducts and, of course, ducts will have some dampers and what not. Well I discovered a couple of years later that Tommy Gibson - who was sort of the point man for the contract at Davie Shipbuilding – he'd had his estimators look at that drawing, estimate the cost of exactly that ducting, very limited as it was, and put in his bid exactly that price. So, if you needed to put one other piece of duct over here and another thing there, it was an extra on their contract. And so for example, I could sit down and at that stage say, "When this air conditioning and ventilation system is complete and ready with what really is going to go in the ship, I don't remember the number, but for sake of argument it would probably cost 2½ million dollars a ship or 3½ million dollars a ship, or whatever". Well, Davie Shipyard had put in a cost like \$325,000 or \$126,000 (or whatever), a very small number, that represents exactly what was on that drawing. So they used this, the shipyards, throughout to say "that's a design change" and "that's a cost increase". We were saying, "look you knew all along you had to air condition and ventilate that ship and you've been doing this for a hundred years, so what do you mean it's all new to you?" In a sense, what the thing was, in detail they were right, you know; in concept we had a case, but you could never win the case.

INTERVIEWER: Were there very many over-runs?

BROUGHTON: Well, the initial contract as I recall with the shipyards...no, the whole program cost was something like 146 million dollars. But then the big program office came in, which was in 1970 I believe. As I said earlier I came on the program in early '69. A year later Larry Wilkins was promoted and made the director and I was promoted and I became the Project Systems Engineer for the 280. And at about the same time they established under, then, Captain Allan, a much enlarged program management office with a number of contract officers and its own little engineering cell - not that they usurped our authority, but just to help coordinate everything – and they went into a major

review to get on top of this whole problem of Government Supplied Material, the drawing arrangement, and lack of technical information and so on. In the process of course they re-budgeted the program. That was in 1970. They restructured the program to, I think, 225 million dollars plus a contingency [to take it] up to 246 million dollars or something like that - close to 250 million dollars. And from that point on it came in within the budget. The main problem was that the 146 million dollars I mentioned earlier was not really for the 280, it was for the stretch Nipigon (which you, I gather, have got interviews on earlier). So, in effect, once you really tackled the 280 program – and what the 280 program is – it did a very good job of completing reasonably within budget, but its base was wrong.

INTERVIEWER: We have already interviewed Jock Allan, who was the Project Manager, and he said that it came in at 245 million dollars, right on the budget.

BROUGHTON: Yes, that was the limit of what the budget was. I'm pretty sure that the main difference in cost between what was 225 million and [the 246 million, was that] they had a contingency for things they knew were going to happen, but they didn't really have a price for them yet, and that was setting-to-work all the Government Supplied Material, which was done by field service representatives generally and their own technical people, and the trials, because none of that was in the original contract. That was the other thing – going back to when Larry Wilkins asked me to review the contract and he knew that. Larry Wilkins was a very far-sighted manager. He picked up on two things. First of all, that there was nothing in there, and he wrote a memo about this very early on before I ever came on the program, that there was nothing in there for setting to work and trialling all of this government supplied material that was going into the ships. There was some stuff for normal ship trials, you know inclining experiment, speed trial, that kind of stuff, [but] none of the detailed trials to set to work of combat control systems or any of that stuff. That was one thing, and the other thing was; he looked at past ship programs and he worked out, based on the displacement and the complexity of the ship, the number of man hours that he would expect a shipyard would have to expend in order to complete the ship. The number he came up with, and the number that would be reflected in the actual contracts to the shipyards, were far apart. So he knew early on that the contracts were under-funded. There was no way the shipyards could complete a 4800 ton ship/destroyer for the amount that was in the contract. So when I looked at it, I found this kind of detailed stuff which I explained to you, just using the air conditioning as an example, and the whole other business of the trials, and so on.

INTERVIEWER: This may be a good point in time to discuss the difference in the design and contracting and building of the DDH 280's relative to the Canadian Patrol Frigate Program.

BROUGHTON: Well, I was involved in the Canadian Patrol Frigate Program only very early on. I was on other jobs and then I came back in as Director of Maritime Engineering and Maintenance in 1975 and the Commodore was then Commodore Allan (Director General of Maritime Engineering and Maintenance). They were just starting – the staff were just starting to write the operational requirement for what became the CPF, and we took it through until, I think this is correct, the 22<sup>nd</sup> of December 1977, when cabinet approved to go to preliminary design for six ships. So this was in the concept phase only, you know, where at the end of that we had a kind of concept design where we could say 'the ship will end up being about this big and it will cost about that much, in order to have these major features, but not even a preliminary design done. Now we'd done some sketch designs and so on, but the interesting thing is that that was for something like 1.8 billion dollars or something in 1975 dollars, and those ships delivered twelve years later. And if you escalate the dollars, they were delivered - not on time because the program slipped and I can give you that stuff too if you're interested – but it was within budget.

INTERVIEWER: How much was that budget?

BROUGHTON: I think the 1.8 billion, by the time you escalated it, this is through the [high] inflation rate period, ended up to be somewhere around 4/5 billion dollars. But if you converted it back to 1975 dollars, which the approval was in, it was within budget. And I'll give credit to two people for that, primarily. One was Commander Bob MacLaren, who actually did the costing, and I'll take a little bit of credit myself, because what I told my people was 'I will accept an error in estimating some feature of this, but I will not accept anything that needs to be done being left out'. In other words, every brick in that wall will be there, even if the size of the brick isn't quite right. I asked Ed Healey who was the [CPF] program manager, later he became Commodore, 'what got missed?' And there were two things that got missed. One was, we didn't allow for the shipyard to get profit on profit, of what the subcontractors were; and, they tried to make quite a bit out of that and they got told to cut it down. But that [profit on profit] was not included. The other one was, we had no costs in there for Canadian Industrial Benefits. But how could we? Because it was after the approval, two years later in the Speech from the Throne, that the government said 'we'll do this, we're going to use government procurement for industrial benefits'. It was relatively small, but everything else, training in the ship, changing docks, ships themselves, anything I've said 'don't miss an item that needs to be included,' [was in our budget]. Now they went quite differently with that program, because what they did was they went with a single contract to the main contractor, Saint John Shipbuilding & Drydock, and they [SJSD] did all the sub-contracting, so there was very little GSM.

The risk is always shared. It doesn't matter how you do it, the risk is shared between the customer, or the owner, and the builder and the contractor. It always is, because the customer's saying kind of what he wants and some of what he says he wants may be conflicting, you know, with some other aspect. And so there's a risk in trying to resolve that and somebody has to make a decision. And there's obviously a risk to the shipyard because he at the start has to say 'well I think I can do it for so much money'. I used to use the example - they would say in the 280 program [as] we kept getting hammered saying, 'it's the fault of the specification, you know' - and I'd take out a pencil and put in on the table and I'd say, 'you write me a specification for that, and if I put enough pressure on it, I'll make your specification leak'. But that's the thing we can't do. You know, if you take out a pencil and say 'I want another one just like that' - don't try and put it in words- and say 'I want another one just like that' - you'll probably get another one just like that [at no risk]. But a ship is a development project, unless you go and buy something exactly the same that's already been built. And whenever there's a development project, there's a risk.

INTERVIEWER: Bill did you get involved with the trials, when the ships were in the shipyard, such as the [HMCS] Iroquois and the Huron?

BROUGHTON: Personally, not too much. It was more to do with the technical people in the other sections of the division. So, for example, doing auxiliary system trials, and so on - so the ship was ready to leave the jetty. They were done jointly by field services representatives; perhaps from the equipment manufacturer or whatever it is that went into the ship, and the technical people from the other divisions [actually, sections]. So from the point of view of the overall ship, which was my responsibility, there were a few trials necessary alongside before she went out. Later on, inclining experiment and things like that were done, but not too much. Now we were very interested in how these trials went, because, of course, out of the trial come shortcomings, defects. And at the time that the navy takes over the ship from the shipyard, they prepared a report of inspection - I think it was called a Canadian Forces CF 1148 - and it listed all the defects. Well, depending on the nature of the defect, it could have been a defect on a government supplied material item which was a Crown

responsibility, but it may have well been a defect on something about the shipyard and it was their responsibility.

Either way, once the ship was taken away from the shipyard, generally speaking it went to Halifax, and then we used the dockyard or the field services representatives from whatever equipment, to correct those defects. And so when Iroquois commissioned in 1972 – the summer of, I've forgotten, June or July of '72 – I took most of my office and moved it down to Halifax and set up a post-commissioning trials office down there. Now, most of the post-commissioning trials were associated with the fighting equipment. But we also had these defects from ship systems as well to deal with. So one of the things we had to do was, before I went down there, every year the dockyard asks NDHQ, you know, 'what kind of work load are you going to give us this year?' So I put in a great big piece of work load that caused everybody to swallow hard. And nobody had really thought that that would have to happen, and the Program Manager's eyes were kind of opened, for the second time.

I should really backtrack to do these trials. Earlier when we were maybe a year away from commissioning, there was a meeting in the Program Manager's office and the big question was 'what are we going to do about these trials?' Because as I indicated earlier, generally speaking they'd been not contacted for. Particularly, setting to work all of this government supplied material and then the trial to prove that once you set it to work, it works right. [We were] preparing all the test sheets, and preparing all the trials agenda, and there was a move there by Mr. Killick who was a senior contract person and the others, to say 'well maybe we've got to forego these things'. I remember distinctly saying 'we can't spend 235/240 million dollars for a ship and not know what you've got'. So they swallowed hard, and said 'well, we have to do this!'

So that resulted in amended contracts for large numbers of government supplied materials, like Pratt & Whitney, in order to set to work and trial because that wasn't in their contract; nor was there time and the support coming out of the shipyard even though it wasn't their equipment; nor once they'd gone through all of that and then you had the defect list that went with the ship down to Halifax; nor was there anything in the dockyard budget. I put that in, and it caught everyone by surprise because the only reason it went in was that across my desk came the annual memo or letter from the dockyard saying 'what do you need next year?'. And so I said, 'Gee, well, you know they're right. I'm going to need more stuff'. I took the CF 1148 and estimated all through every item on there, personally. And if I really knew what it was like, I'd put an estimate like that and I left it, and if I didn't, and I thought it was kind of fuzzy, I added 10%, and if it was really fuzzy, I added 25%. And that's what I put in. And I did that within pretty close within budget too.

INTERVIEWER: What was that figure?

BROUGHTON: Well, I think it was like a half a million dollars or something like that. It was required in man hours and I just don't remember. An interesting story though, when you asked how I was personally involved in the trials; I flew to Quebec City, got a staff car [that] drove me to Les Escoumins – on the Gulf of St. Lawrence on the north shore; well not quite down to the Gulf. Where the Measured Mile is. And that's where Iroquois was to run the lead ship measured mile trial to see how fast she'd go. And I remember waiting at the jetty for the pilot boat to come. That's why they did it there, because that's where the pilot was for the St. Lawrence. And it was a foggy day and I saw this beautiful ship come out of the fog about a half a mile away and stop in the water. And this boat came and got me, took me aboard, and then later that day we ran the trial. Well, of course when they do the trial, they have a little wager as to people guess how fast the ship would go. Well, I had some inside information because I knew what the model test tank results were from the National Research Council, you see. So I put down my number, which I think was 29.8 knots. Well the first run they did

was, I believe, upstream. OK. And according to the charts, there was a one knot current and the thing came out 28.8 knots. And I'm rubbing my hands because everybody had put a buck in the pot and there was about 20 or 30 bucks there, a lot of money! And then they turned around of course. They go the other way with the current and I'm looking at the same 29.8 [and she should have got 30.8]. The thing went down there at about [actually well over] 31 knots, I believe. And I couldn't believe it. Somebody else won the pot. I found out later that Gwyn Holtby, who was the machinery control system guy, he had tweaked the controllable pitch propeller and upped the pitch from the design pitch by a degree, or something like that, to make the ship go faster and he was successful and I lost my bet. Anyway, then when we got down to Halifax, as I say, we coordinated running the post-commissioning trials, and we were there two years to handle the four ships.

INTERVIEWER: Well I was the chief engineer of the Iroquois, for those trials.

BROUGHTON: Yeah, you weren't the engineering officer, that was Bob Douglas...

INTERVIEWER: No, Ron Hawn...

BROUGHTON: Ron Hawn was, that's right! Bob Douglas had another ship.

INTERVIEWER: Don Wilson was the Huron, but I was the chief engineer as a civilian...

BROUGHTON: For Pratt & Whitney?

INTERVIEWER: Pratt & Whitney. My contract was with United Aircraft, but I was actually working for German & Milne, so I had four bosses; I had German & Milne who had a contract with United Aircraft, who had a contract with the government. The shipyard was my other boss; so I had four bosses.

BROUGHTON: Yeah well, you had one more than I did. Down there it was the best job I'd ever had in the navy, in the post-commissioning trials; because, first of all, you were working with these brand new ships, and it was just a thrill to do that. I had three bosses and they were all a thousand miles away up in Ottawa. One was a program manager, who wanted me to stay within the budget and get the job done; another was the technical officer who, of course, wanted to make sure I did things technically correct; and then there was, in those days, a Material Command where maintenance and support within the Canadian Forces was separate from the design. For the navy they used to be together, but they were pulled apart as part of [Canadian Forces] Integration and later they were put back together. For a while I had this third boss in the Material Command who knew of course all the maintenance and stuff we'd have to do in the ship including some of these defects kind of thing to report to [them]. They were all a thousand miles away and here I was, if I could use the term, 'robbing the local Admiral blind' of his resources because he was desperate to get his ships. So, you know, I had Lieutenant Commander Mike Lambert who handled all of the work through the dockyard and I had Lieutenant Ron MacKnight who coordinated all the trials and he had an assistant, and then we had other support staff, secretaries and things like that who operated teletype machines. I didn't tell you about the teletype machines! One of the really useful things that we had – nowadays it seems like an anachronism – but we had teletype machines in the design office and when it set up the program office, the drawing office, the two shipyards and in Halifax. So whenever you wanted to order something, give direction, ask about a problem, you just typed it into the machine and everybody got it right away. It was a direct link teletype machine. In effect it was an earlier version of the internet with up to five people on it, and without that, the program wouldn't have moved nearly at the speed it was able to even though there was some delay. When we moved into the office in Halifax we hooked into that setup. We had a DSS officer on our staff too, I should mention that too, Bill Davis. And whenever we got into supply problems he handled those. So it was good because they gave me the people I needed and, as I said, the bosses up there came down

periodically to see how it was going. But really we had full access to the resources that we needed at the dockyard and for calling people down from Ottawa for the trials and so on to get the thing done.

INTERVIEWER: Now did that office stay until the last ship was trialed?

BROUGHTON: Pretty much, it folded in '74 and that's when I left.

INTERVIEWER: That was the end of the office, when you left?

BROUGHTON: Yeah, now the program manager office and the program itself, of course, continued on for some time, particularly to do with spare parts going into the supply system and so on, so that various offices were involved in a diminishing way for I think up to maybe another five years. I can't remember exactly when the program management office folded its tent.

INTERVIEWER: Bill, what were the lessons learned from your perspective from the DDH 280 program?

BROUGHTON: You mean like from the contractual arrangement kind of thing?

INTERVIEWER: Yes.

BROUGHTON: Yeah, well as I described earlier we had both these shipyard contracts and these independent government services, or government supplied material contracts which caused contractual difficulties and technical difficulties. And so there was a clear decision to get away from that the next time around. In the 280 program, despite having these government supplied materials, the contract ostensibly was written for the lead yard, Marine Industries Limited, as though they were in charge and had the risk of putting things together, but in fact they did not because of these arrangements – it just couldn't be. So there was a clear decision to get away from that arrangement and to go to a prime contractor or consortium which would obviously have to include a shipbuilder but may not be a shipbuilder in the lead. Before actually doing that, jointly the Department of National Defence and the Department of Supply and Services went and looked at other programs, other countries. So we went, for example, to look at a 963 Spruance Class in the States – went down to Pascagoula where they were building a much larger ship, an 8,000 or 9,000 Ton destroyer leader. But we were interested in it because the arrangement they had was their staff, presumably, prepared an operational requirement with scenarios of how they wanted the ships to operate and that was it. They gave it to the prime contractor and said, 'You start with that and come back with a preliminary design and go through the whole process' [i.e.] starting with no technical requirements at all; strictly operational requirements. We also then went to Holland, to look at the Dutch Standard Frigate which was much closer in size to what we might be looking at for this Canadian Patrol Frigate Program. In that case they had an arrangement where there's a designated lead yard in some ways like we did the old St. Laurent Class where Vickers was the designated yard and in effect they [the Dutch] negotiated the contract; there wasn't a competitive bid at all. Well, we did not want to go in a non-competitive way, we didn't have kind of a single shipyard like they had in Flushing in Holland that we would go to. Because they also had a submarine program and that went to the other big yard. That's how they kept them happy, the two of them. Nor did we, the technical people, certainly, and generally, want to do the Spruance Class in the States where all that they gave industry was the Operational Requirement.

END OF SIDE ONE

*Tape 1 Side 2*

BROUGHTON: The Canadian Patrol Frigate Program was not to have a directed contract to a single yard as they do in Holland, we wanted a competition or a competitive bid, and also not to do exactly what they did in the 963 Spruance Class in the United States, where all they gave the prime contractor was the Operational Requirement. It was certainly among the technical people a desire that we maintain technical standards, in particular for the ship. So what was decided was that there would be a competitive bid for the initial phase, to qualify, and I think either four or five, I can't remember, consortiums put themselves together and bid on it. From that, two were selected who then proceeded into the initial design phases before a single one was selected for letting a prime contractor for basically everything in the ship [and its] required equipment and doing the whole business. That ended up to be St. John's Shipbuilding with their subs [subcontractors]. But what we gave them in fact was put together not only the Operational Requirement but a very detailed technical requirements/standards. In other[ words] we didn't say that the auxiliary system had to use these equipments and so on, but it had to meet these standards – if it was a salt water system you were putting in a ship, that had to have copper nickel pipe, just as a detailed almost mundane example. But when you put that all together for the whole ship, it turned out to be a package that was several inches thick. So we gave them in fact a very detailed thing. In effect, to answer your question of 'what lessons did we learn and apply', well we learned that we wanted to have a competitive bid, but we wanted to have a single prime contractor. And that was a result of not only the 280 program but in a way going back to the St. Laurent and River Class Ships, where we had a lead contractor and basically a 'cost plus contract', not a firm price contract, and then designated yards were given other ships in those classes.

I attended an interesting meeting when we examining the 963 class, and at that time it was just before [I got] involved in the CPF [actually, the 280] – and I think Bridgman was the Commodore, Director General of Maritime Systems. We had an Admiral Weschler, who was the Program Manager for the 963 Class (the Spruance Class) in the States, come and give us a briefing on their process which subsequently led to us visiting their yard. And Commodore Bridgman asked a very interesting question – I know this because I wasn't part of the project but I was the minute taker – and he said 'if you do it that way, what is the demand on the resources of your technical staff to do it that way, compared to what you've done in the past?'. In the past they'd generally gone to a preliminary design within the navy and then shipped it out. And Admiral Weschler's reply was, 'you're going to need more people and they need to be better trained'. And so, a real issue became with us was the number and quality of the people that we had to oversee a program done like the 963 class. That's one of the reasons why they made the decision to include in this [CPF] contract package if you like, that they went out to industries with, the technical standard and requirements. Because we felt if we did that, we wouldn't need as heavy a technical staff resource in support of monitoring that program. It's easier to say 'have you met this requirement that we've given you?', than it is to go and say well 'what have you done in this case, what standard have you used?' and 'is the standard one I'm familiar with'? Then we have to go and examine that standard and say whether we think it's OK or not. Instead it's easier to give them the standard and say 'meet it'. And that was an influence as well.

INTERVIEWER: That's very interesting Bill. Another question I have now, do you know of other personnel that are still around that could be interviewed on the DDH 280 program?

BROUGHTON: Well, probably a large number but just to hit some key spots; Larry Wilkins who was the initial project systems engineer 280 before me and I believe he's retired down in Nova Scotia; Commander Bob McNeilly here in Ottawa who was on the staff of the technical services detachment in Sorel where the lead ship Iroquois and Huron were built. The only name I can recall now at the Davie Ship I think was Joe Cunningham. I mean the detachment commander was Boyle, I think that

was his name Commander Boyle. I don't know that he's still alive - and certainly the detachment commander in Sorel has died, but his name will come to me....

INTERVIEWER: Alec Arnott

BROUGHTON: Alec Arnott is right...and you know, Keith Farrell was the overseer in Montreal for the drawing office. Of course he's gone.

INTERVIEWER: Slim Ingals was down in Davie...

BROUGHTON: Yeah, that's right...

INTERVIEWER: ...and he still lives in the Hamilton area

BROUGHTON: That's right, I remember him now. And then here in Ottawa – you know, I mean if you want to get down to the Department of Supply and Services side – the main people, our initial contract officer was Bob Corbett. I have no idea if he's still around or alive or where he is. Then when they enlarged the office, the two principal contract people were Harry Bolster and Larry Sellick. I know Larry Sellick is around, but I don't know about Harry. In the technical division, where I was, from other sections, Ed Healey who had the prime movers, was a key person, I know Gwyn Holtby who did machinery control systems is gone. On the combat system side, I'm not sure of Jim Dean's involvement or if he came later, anyway that's a start.

INTERVIEWER: I think Jim came in later; he was very much involved after the contract was finished; the construction.

BROUGHTON: Well, if I think of any others I'll let you know later.

INTERVIEWER: Thank you very much then Bill. Bill have you got anything more you'd like to add to this very interesting interview regarding the DDH 280 program?

BROUGHTON: Well, certainly from the main focus of your project here to do with the industry relationship, I think I've pretty well covered everything that I can recall. But certainly there are a lot of technical things I could add but that's really not your focus. I guess in summary I would say, that although the 280 class project was kind of used as an example of how 'not to do' things - because it [the contractual arrangement] was so complicated and caused a lot of difficulties contractually – on the other hand, the ships turned out to be highly successful ships. And here we are over 30 years later and with three out of four still operating. And I think the only reason the fourth isn't is because they are getting old and it's harder to maintain and replace them and they're literally cannibalizing it to get the other three going...highly successful. Mind you, they did have an update halfway through their lives. So I think that's it! If I think of anything else I'll pass it on in the future.

INTERVIEWER: Thank you Bill for this very good interview. We will then get this recorded or typed for you. We'll be sending it back for a little editing...would you mind doing that for us?

BROUGHTON: I'd be happy to; I mean I won't change the sense of anything, but if there's poor grammar or whatever I usually don't mind. I'll correct it for the record.

INTERVIEWER: Thank you Bill. This ends the interview with Commodore Bill Broughton, eleven thirty on January the fourth, two thousand and seven.

**TRANSCRIPTION ENDS**