



Oral History Interview Transcript

Interview Control Number: 6-C11 Welland

Interviewee: Adm. R.P. Welland

Interviewer: Tony Thatcher

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Transcribed by: S. Mohamoud

Transcription of Interview Number: 6–C11**Admiral R.P. Welland****Interviewed 5th November, 2006****By Tony Thatcher**

INTERVIEWER: This is a CANDIB Oral History Project interview with Admiral Welland That was recorded in White Rock, British Columbia, on the 5th of November 2006. Admiral Welland was interviewed by Tony Thatcher and the participants have signed the Copyright Release Form. This is tape one, side one.

The subject of this interview is the controversy relating to the early negotiations for the acquisition by the Canadian Navy of what became the four DDH 280 destroyers in the time frame of 1960 to 1965. The choice of propulsion machinery, number of helicopters and the armament all contributed to the expanded requirement of the ships, which the government [politicians] thought would be a repeat DDH 265 Annapolis Class Destroyer [General Purpose (GP) Frigate].

The participant groups of this interview were the Navy and Canadian industry, and today's interview will present this fascinating story from a naval perspective. Admiral Welland is a decorated naval officer who had a long and distinguished career in the Canadian Navy. He spent many years at sea with the Royal Navy and the Royal Canadian Navy, in surface ships, naval air positions, as well as naval headquarters. I'll ask Admiral Welland to introduce himself and just briefly describe his naval career at the point that is covered by this interview.

WELLAND: Well Tony, I'd been the Captain of [HMCS] Shearwater for three years and then I was sent to Ottawa in 1960, in the autumn of 1960. My job was the Director of Operational Requirements, which meant that I had a staff of experts – gunnery, communications; about half a dozen lieutenant commanders, who said they knew what they were doing and were up to date in all technology. I was their boss to coordinate all this.

When I relieved Captain Frasier Harris in the job, they were already well along on planning the next generation of destroyers. That was a constant on-going thing in the department; they were always planning the next one. I inherited what they had done and continued the work. At that time it was called the; I think, we were calling it the GP Frigate, and it was an improvement on the previous class which I think were the Mackenzie's, or whatever they were. They were steam driven and had the same engines as the St Laurent [Class] and they had all been very successful ships, but we had moved to helicopters by that time; to put helicopters into the ships and they were already installed in a number of ships. No, perhaps they weren't; I think the trial of the first helicopter [landings on a destroyer] was done in 1958 onboard a frigate. Anyway, that was the plan and we knew what we wanted to do.

So, I had that job from 1960 to 1962 and it was during that time that we laid down what this new class of ships would be. We didn't know how many ships there would be in the class; in fact I had been involved in this sort of thing several times in Ottawa previous to this. I was involved in the planning of the St Laurent's from 1947 to 1949, and one never knew how many ships there were going to be, but we guessed eight because that just happened to be the number of shipyards that could build them. These were spread from one end of the country to the other, so you know it would have caused real problems if it came up to seven so they tended to be built in eights. I

think the Mackenzie [Class], one class, was only built in six because a couple of yards had got other work or gone broke, or whatever. Anyway we weren't concerned with the numbers. As far as we were concerned the higher the number the better. Now should I stop about here?

At this time it should be remembered the Soviets were putting a lot of pressure on the Western world. I remember that the Berlin Airlift just happened or was happening when the Russians were trying to seize Berlin from our side, they were arming all their armed forces with new machines, so we were keen to keep up, in fact, be ahead of them. At that time I had a lot to do with the American's and the British and the other NATO people in comparing what we ought to do, what they were doing and so on. So as a result of all this, I think we pretty much had the GP Frigate, which morphed into the 280 [Class] by the end of 1962. I think the specs were pretty much settled about what the ship was intended to do and so on.

Now during that time, I'm not sure if I'm going to get this absolutely correct, but the chief engineer/chief designer at that time was Rowlie Baker (Commodore Baker) and he had an assistant called Sam Davis, who was the deputy chief of design. The chief engineer was [Rear Admiral] Jack Caldwell. I was very interested in gas turbine propulsion. I'd always been interested in airplanes and I knew a lot about gas turbines. I'd just come from Shearwater where we a lot of them on the station. We'd ordered new helicopters, the Sea King and it was a turbine and so on. I couldn't help but think back to the ships I'd been in where you needed three boiler rooms; two boiler rooms in a Tribal [destroyer], swarms of stokers, complicated things, whereas there was hardly anybody standing on the wing of a 727 [aircraft]! So at that time, earlier on I started talking to the engineers about 'let's have a look at gas turbines'. Now at that time, no warship in anybody's navy was propelled by gas turbines. I had raised the issue, and I say 'I' not with any [pride], but I was the instigator. I know I was because I had lots of accusations made later and not very many were complimentary. Anyway, when the Cuban Crisis happened, I was sent from Ottawa with one days notice to be the Commander of the Fleet and I kept that job for two years and I came back to Ottawa in 1964 and I was made the assistant (ACNS ANW). Anyway, the staff I had in '62, maybe a few faces are changed, but I went to exactly the same department. I was now more important and the Director of Operational Readiness reported to me, but it was the same thing I had done before. So, at that time now the GP Frigate was pretty well along; people knew what we wanted. I started agitating for gas turbines, and how I really got into this was when I was Commander of the Fleet either Ottawa or I organized a lot of the industrial people, the Air Industries Association and Shipbuilding Association, to come onboard [HMCS] Bonaventure and spend a couple days at sea. We made a trip from [HMCS] Shearwater where the carrier normally berthed, to San Juan, Puerto Rico. We had about 20 or 30 of these top industrial people, there was Frank Lowery from the Shipbuilding [Association] – I remember him – and Thor Stevenson from United Aircraft and Phil Garrett from De Haviland. We had all the [the interviewee later revised this clause to read "They were all"] leaders of industry and we put on a good show; dove submarines, flew airplanes and so on. During that time I was front and centre for this, I got to know some of these people pretty well and we had a party in San Juan and they flew home.

Getting back to the gas turbine thing, I was told to shut my mouth several times about this by the engineering department because I know I was causing trouble by saying 'these ships we ought to have a real hard good look at it'. Anyway, I went to see Thor Stevenson, who was the head of United Aircraft (Pratt & Whitney) in Montreal and I told him about this and he said; "Well you know, why don't you come down Hartford Connecticut because it just happens we have a 25,000 horsepower gas turbine on a test bed and we're doing it? We're looking ahead, the company is,

because we think that that is the engine to put in container ships – high power, easy to maintain, don't need a lot of staff".

So I went down there with him and had a look at this test set-up and here was this turbine grinding out - they measured it in different things than horse power but it amounted to 25,000. Noisy as hell, but it had been running then for something like three months, you know, it was well advanced. So I discussed with him about propelling ships, now he knew practically nothing about ships, but he promised to bone up on it and the end result of this was that I persuaded the Naval Board to listen to me about propelling that ship with gas turbines, and I invited Thor Stevenson along as my guest so he could speak about it. Well, this wasn't too popular with the engineering people and I knew it wasn't. Now they had done wonders with the, what was it, the Y100 [steam propulsion system], 15,000 horsepower engine (something like that). They had a test bed in Montreal and they had developed the engine and it had been very successful.

Anyway, Jack [Caldwell, Chief Engineer of the Navy] and I were pretty good friends. Well, he was really pissed off with me about me going on with this gas turbine thing and what's more in inviting an industrial guy to the party to tell us how marvellous his engine was. I think he must have thought I had got some kickback from the engine company, which unfortunately wasn't true. Anyhow, during the meeting Jack got really annoyed with me and he said "It's a fine F***ing navy when some executive officer tells the chief engineer what kind of engines he ought to have". I may or may not have apologized. I had some people on my side in his department and they of course wanted to keep their jobs so they weren't shouting in my support at all, in fact they were completely silent [the interviewee later added "but not in private"], Rowlie Baker thought it was a good idea amongst others. Sam Davis [the interviewee later added "had relieved Commodore Rolland Baker as Chief of Ship Design"] made a trip to England and found out that the Royal Navy had put a Rolls Royce, I think it was an Olympus engine, into a destroyer along with - they substituted one of the steam engines - they went to a lot of trouble. They tried it for several months and they reached the conclusion that it wasn't a good idea. Sam Davis, who was a very honest, straightforward and clever guy, said he found out it was a hell of a good idea, but the steam guys in the Royal Navy could see their whole industry turning into rat shit. All the people; Parsons Turbines, Babcock & Wilcox boilers, the whole miasma were going to go down the drain. So the Royal Navy decided they weren't going to do it, but Sam told me that it was a great success and that they decided they'd solve the propeller problem with the...I think they were using the Swedish KaMeWa propeller, but that was in competition with the Dutch one called Lips. They were making reversible pitch propellers.

I never mentioned Sam's involvement in this [the interviewee later added "to anyone"], but he was prodding my little bum and said go for it. There was complete silence from the engineering people. All my junior staff were prodding me from behind saying, you know, "let's be the first". Anyway, the naval board decided that we go for gas turbines and not only main propulsion but the whole damn thing. I'm not sure that I lobbied for that, because I didn't know too much about it but the ship was built. Before I left the navy in 1966, it had been decided that the contract be let before '66. The Sea Kings had been ordered. But enough about the engines! Anyway, Jack was not my dearest friend after that. He took it kind of personally, which he should not have done because it had nothing to do with personalities at all. But he had a very good looking wife called Kay, and she and I were great [the interviewee later deleted "great"] friends, she was English and she was lots of fun, but do you know she wouldn't speak to me at cocktail parties after that. If I had known that, I would have never pushed for gas turbines!

INTERVIEWER: So the decision wasn't made then based on research or into the advantages or life cycle costs?

WELLAND: Oh yes, I and my staff we dredged up endless information. "I still have some numbers" [the interviewee later withdrew the statement in quotes], I had to make speeches about this to the Navy and also when we peddled it to the government, DSS, and the Treasury Board I was the front and centre guy. We had done a lot of homework on it, we showed that we could extend the range of the ship – a trade off between weight and range and people and so on (the saving in people was something like 30 people in the crew). It was firm and we had all the backup work from United Aircraft and it was put out to competitive tender for the engine, now Rolls Royce bid on it, but it was decided to go to (although it might have gone to other people I'm not sure because the French had big engines too) United Aircraft got the contract and if I remember correctly Lips got the propellers. So much for the propulsion, but I'm still sorry Kay Caldwell wouldn't speak to me at cocktail parties!

WELLAND: On the helicopter side, we had put helicopters into other ships at that time – one helicopter. The St Laurent were the first class to be changed I think, but the airmen (I had some very good airmen on my staff) anyway, when I left Frasier Harris came back and took over my job, so he continued on. We were both progressive guys interested in flying and so on.

So by the time I came back in 1964 the airmen said "two helicopters are so much better than one". The crew demands two helicopters for support [the interviewee later revised this clause to "The support crew for two helicopters"], only changed by two people (the pilot and the observer), all the maintenance guys are the guys that kept the damn thing going and they could look after two helicopters just as well as one. In fact, it would have been better to build an aircraft carrier. We finally persuaded the powers that be that we should go for two helicopters, mainly on statistics – search, serviceability, availability of the helicopter, and so on, so it made sense to have two instead of one. I was greatly disappointed later on they reverted back to one. It was a retrograde step when that happened with the new frigates; it was a backward, backward thing.

There was much argument about that, there were people in the navy, it wasn't only the engineers that I had a pissing contest with, it was also the gunnery department. I remember pointing out at a meeting that the navy had changed a great deal, that the gunnery people may or may not have won WWI despite what they'd said, but things had changed and if they had looked around they would find that the anti-submarine department had at that time five sonars (we'd changed from ASDIC - the word) in the ship and one gun. When we started and fought the war we had eight bloody guns and one ASDIC and we damn nearly lost it because of that. I had a lot of internal trouble with the gunnery people, in keeping guns off that ship. They wanted to load it up with everything that went bang, and you know it was a waste of effort so I had a lot of dissent within my own department on that score. When we finally decided, I'm not sure if I'm correct but, everybody in the world that made guns tried to peddle them to us – especially the British – but we had such terrible experience with the 3 inch 70, you know. It was a marvellous bloody gun as long as you didn't want to fire it. It looked pretty and it was a nice shape, and it was suppose to fire 40 rounds a minute but if you got off two you were lucky if it didn't jam. I had some operational trouble with ships that had that gun; it just couldn't be looked after. My good friend Vic Henning who ran the ordnance department said that there wasn't one (I think we had six ships with it) of the mountings that was the same. You couldn't stock spare parts because they didn't fit, they were sort of filed personally by some guy in Manchester, and so it was a very difficult gun to maintain. I think we bought it too quickly (the first ones)... so no more English

guns. The Americans were peddling a five inch gun, but we finally settled on an Italian one which caused a slight problem. They were selling it to other European countries; I think the company was called 'Oto Melara'. It was a five inch gun, excellent, worked well and I don't think we had any trouble with that gun – I think that the American ammunition fitted it too; I think you could swap the ammunition.

I had other problems with that ship in the design. I remember when I went back the second time, the design hadn't been quite settled. The Operations Room had been laid out in an illogical way. I had it turned around, which cost a lot of money, but it wouldn't have been sensible if it hadn't been turned around. It turned out that those ships were extremely good, their operational organization was excellent.

INTERVIEWER: There were two rows of displays – command displays.

WELLAND: Yes, there was a fellow named Brian Judd [interviewee later asked to delete "Brian Judd" and insert "Dan Hanington"] who was (at that time the digital world was coming into being) a navigator by profession, but had a great deal of sense about the layout of Operations Rooms and so on. I remember he was a stalwart of mine, but that had been something I had really taken a great interest in from 1942 when radar was first put into ships. It was put in the most illogical way by technicians who had the screen facing to starboard when the ship was going straight ahead, and you had to turn your head [brain] around to make sense. Some people couldn't do that, including me. You know there is a right way and a wrong way to a layout. I've driven cars, especially English ones, where things are not quite that handy – the brake peddle is in the back seat, "and you know this kind of stuff" [the interviewee later revised this clause to "is not a good idea"]. Anyway, there were a lot of decisions to be made.

We had real trouble with the missile system, about whether to go for it or not, and we went for it. Nobody really spoke against it too much; if anyone had I don't think that ship would have been fitted with missiles. I wasn't too sure myself, but the trouble was that the Soviets had stand-off weapons that made gun fire almost useless. You know the gun couldn't reach the aircraft that was firing the missile, but these missiles were borderline as to whether they'd be effective or not although without them the ship had no protection. It was an expensive decision. I'm not sure to this day if it was right or not, but as no wars have happened and no ships have been sunk it was probably OK.

INTERVIEWER: Well they certainly lasted until the modernization of the ship.

WELLAND: They continued on with them.

Well you asked about settling the design of the ship and a rumour that went around that it was designed on the back of a cigarette package, with me holding the cigarette package or a pencil...absolute crap. We worked our heads off for months, research, everything. What happened, how that story would have got around was that having everyone working for four or five years and everyone in the navy trying to get a new shipbuilding program, you know to get new equipment; you don't have any friends except the Shipbuilding Association. Everybody else, all other departments in Ottawa are dead against it as you are taking their money. The only reliable friend the Navy had was the Shipbuilding Association of Canada. I think it'd be fair to say we made love to them, constantly, I know whenever I had a chance I did. I was a speaker twice at their annual meeting; once during this thing. Anyway the fellow that was really front and centre in there was Dick Lowery. He was the president for a number of years; he probably did more to get us the 280 program than anybody else, including me [interviewee later asked to delete "including me"]. He had unemployment problems in Quebec...that is when the unions and

shipyards got together and they all started crying the same tune. If they could put enough heat on the government, we got the program and if they couldn't, we didn't. I don't think the Navy, or the Air Force, could ever on their own have got a program. It all had to do with the industrial work and there is nothing wrong with that. It was just the way it was. If you didn't understand that and you tried to get a program, you're not going to get it.

INTERVIEWER: I know there was a policy or in the past where you mentioned that the ships were sort of given out to yards according to a formula, I guess one per yard, did that have any impact on this particular program?

WELLAND: I don't know because the ships were actually built after I left the Navy. I had sort of a pissing contest with Mr. Hellyer, I mean personal. We used to call each other Bob and Paul, but I got around to calling him "you horse's ass". So I left before, maybe the contract had been let prior to my leaving but anyway, I wasn't in the contractual business, but I would think the same rules applied.

INTERVIEWER: You mentioned some of the equipment, was there a thought about building, say, the missile system and the gas turbine in Canada or were we basically looking at capability at that point?

WELLAND: I remember we looked into that, and there were a couple of companies in Canada. I think Bristol Engineering in Winnipeg; they were making some rockets for meteorological research. They wanted to get into the act, or build, cooperate with the Americans. Nothing ever happened about that. We didn't know much about missiles in those days, if we know now I don't know...I don't think so.

INTERVIEWER: Generally, we still buy them off-shore.

WELLAND: Yes, we weren't into that. I think Canadian industry did well with the 280s. Once a program got going, the shipyards cooperated terrifically with each other; that was my experience. Up until the contracts were let, of course, they had to fight it out, but once they were going they cooperated.

INTERVIEWER: The shipyards obviously had a lobby group, and that's how they brought themselves to DND, but the other industries, were there any other companies or equipment suppliers or anything like that?

WELLAND: Oh yes, endless. You see, we had a pretty sizeable navy then. I remember when I was COMFLEET, out of Halifax there were 42 commissioned ships; a carrier, a cruiser, a couple of dozen destroyers, and frigates. I mean it was quite a different thing than it is now. All the industrial people; I had a good friend in DSS, Jack Rutledge, and also... I'll think of his name... [the interviewee later added "the Deputy Minister, Gordon Hunter"], but I was quite close to DSS [Department of Supply and Services], the purchasing people. We didn't fight with them, it was a convoluted organization, but we cooperated very well together to get things done. I remember this guy, Rutledge, telling me there was something like 1600 sub-contractors to build our warships. Now the Navy didn't do that, this was DSS which was largely staffed by ex-naval people and air force guys - engineers that went from the "Navy" [the interviewee later changed this read "Services] to DSS.

INTERVIEWER: I guess they would be the ones that.....

WELLAND: [Admiral] Bill Christie was a director in DSS.

I remember just one little aside. I left the navy in problematical times, I couldn't have stayed because I had such a bad relationship with Mr. Hellyer and he was holding most of the cards. But three years after I left I was then the president of the Sperry Gyroscope Company; I went straight from the Navy into industry. The same guy [the interviewee later added "industrialist"], Jack Lowery, called me up, it would be just about 3 years as I was running Sperry and he called me and said 'who do I see about getting another ship building program?'. So I said, well I don't know because I'd taken not much interest in the Navy. I was too busy doing what I was doing. I had 300 employees belonging to the United Auto Workers Union amongst other troubles. Anyway, I said I'd find out and call him back and it took me two days on the phone – I was in Ottawa – to find out what industrial guy, any industrial guy, who would want to build a ship and who should he phone? I found out after two days that the person in charge of shipbuilding was a brigadier in the Army stationed in [CFB] St. Hubert. I called him - his name was Bob Rothschild - being a friend of mine in the Army, and I said 'tell me what's the plan' and he says he didn't know he was in charge of shipbuilding. I tell you, that's how bad the liberal government disrupted the armed forces by this integration. The Air Force [situation] was the same and nothing happened. Just awful!

INTERVIEWER: I guess their [the government's] involvement was at the organizational level rather than say, did they influence the design of the ships or did they get down to that low level?

WELLAND: No, I don't think once that the contracts were settled the government wouldn't interfere.

INTERVIEWER: Or [influence] the requirements?

WELLAND: No, there were no ships built after this for years and years. You're not here to get my political view on integration, but obviously it was a shambles, it cost the country a fortune and disrupted our armed forces. They're still disrupted by them.

INTERVIEWER: There would have been a delay, can I say that, in the shipbuilding side coming from the last ships built, which were the Annapolis Class destroyers but then there were the supply vessels, AOR's, and the 280's weren't long after that I suppose, but did the political situation delay that?

WELLAND: Oh yes, the liberal government (Trudeau and so on) they deliberately set about to emasculate the armed forces and succeeded – they really never recovered. And this was done - they reduced our armed forces dramatically - this was done at the height of the Cold War, when the Russians, the Soviets, were really threatening us. We had left the USA to carry the can. Our anti-submarine effort which was very good and very important in the North Atlantic Ocean in NATO just turned to rat shit. By 1975 it was [almost] worthless, the [aircraft] carrier was disbanded (you know the whole thing) [a major contribution in anti-submarine warfare within NATO]. This was a deliberate (in my view) policy. It really pissed off the Americans; we were no longer doing our part. We haven't done our part until just recently [the interviewee later deleted "until just recently" and added "since. We risk losing our country. We do."].

I'd like to say a few words about our Navy's long interest and successful interest in developing the new sonars. I was involved in instigating sonar development in the Navy. I became a specialist officer in 1940. At that time we had two specialists - when I graduated we then had two specialist anti-submarine officers - Pat Russell and me. Actually there was one prior to us, his name was Bully Pressey, but he'd learned it in WWI [the interviewee later asked to remove "in WWI"] when the submarine detection system was a trained porpoise, but we'd moved right along. I took a great interest in this. It was called ASDIC then, but let's call it sonar. In 1941, I was put in charge of a work-up base in Pictou [Nova Scotia]. I started the base; I mean it's hard to believe these

things at this time when the world is fairly well organized. One has no idea about the disorganization, and the pressure that was put on young people who were suppose to know what to do. I was sent from Halifax, where I was in the anti-submarine school, to Pictou with about half a dozen petty officers and a warrant officer called Pat Budge and another warrant officer called Pratt. I was told to organize a training system for corvettes coming down the river [St Lawrence]. They were just being built, the first ones, arriving in Pictou for training. We had them for four days and they were to be trained to face the North Atlantic and escort convoys. These were the kind of ships we were sending to sea, the crew was so ill-trained that usually the shipyard people had to bring the ship down the river because the crew didn't know how to run the engines. Usually the captain was OK, he'd be an ex-merchant mariner so he knew his way around, but the degree of skill [of his crew] was close to zero. So we would go onboard and organize these ships for four days. Now we had a submarine there and it was the O-15 and it was a Dutch submarine. It had escaped from Holland and come to Canada; it couldn't stay in England because the British torpedoes wouldn't fit its tubes so we had it as a training ship.

I noticed that some days off Pictou we could get ranges out to 6000 yards, if you used a stop watch, because the actual official recording only went to about 2500. Some days we could get ranges of 200 yards or nothing! I started wondering about this, 'what was the reason?' The Dutch officer, whose name was Hans Soede, told me that it was well known in the submarine community that there were layers in the ocean and that probably (they didn't have sonar) this was the cause of it - of these extraordinary differences between one week and another; even one day. I went to sea in his submarine and he showed me it was possible for him to balance his submarine on a temperature gradient in the water. He was able to do it because they had temperature gauges in the submarine. We didn't have any instruments to do that at that time. Later on in 1941 I was on the West Coast, and I was in charge of a new antisubmarine school. We borrowed an American submarine just before they came into the war, and the captain's name was Keating. He had the same sort of things [detection problems] in the Straits of Juan de Fuca - I asked him. Like Soede, he knew all about temperature gradients, the fact that the submarines buoyancy alters dramatically with temperature changes in some waters. So I had a conversation in 1945 [the interviewee later corrected the date to 1942], during the war, with a fellow by the name of George Field. George was a scientist. We got to know each other quite well, and in 1947 I was sent to Ottawa, and by that time the Defence Research Board (DRB) had started taking an interest in this whole business of temperature gradient in the water. Now this was not being done in the UK or in the US. The end result was that DRB started a major program in researching what this meant.

INTERVIEWER: End of tape one, side one.

END OF SIDE 1

INTERVIEWER: Tape one, side two.

WELLAND: Ok I'll go on talking about this anti-submarine thing, mainly because it interests me and perhaps nobody else. In 1947 I was sent to Ottawa and my job was running the anti-submarine department, and for two years I worked very closely with DRB. They, by this time, had established Bedford and were really getting into the science of sound in water. I think it's true to say that at time we in Canada were farther ahead in research to do with sound in water than anyone else. Woods Hole [Oceanographic Research Institution] in the US were getting into it, but not to the extent that our DRB were. There were outstanding people in DRB: Dr. Solant was one, Zimmerman was another, and George Field (he was the guru for sonar). As a result of them taking an interest they realized that if you could submerge the transmitter, get it down to the correct water gradient in the right place, you could get long ranges. They did experiments off Halifax, off

Chebucto Head, because it was notoriously temperature gradiented there. Some days you couldn't get an echo 200 yards off a merchant ship along side you. Most times it was almost impossible. I remember going to sea in a [DRB] trials ship there, I have forgotten its name, and there they had an experimental submerged transmitter and receiver, and we got an echo at 12,000 yards in temperature gradient water where you couldn't get 200 yards on the sonar on a ship's hull. So it meant transforming [the interviewee later revised this clause to "showed the way to revolutionize"] the detection of submarines, if you could tow a sonar at the right depth. For years, I guess for 20 years in the navy, I never left that program. I was away and doing things, but I was in constant touch with it – mine was a minor part compared to DRB. We had young officers coming behind that also took an interest in the science of this thing because that's what it was. As a result we were the first country to produce a towed sonar and it was called SQS 501, I think. [SQS] 504 was a single searchlight sonar and that towed down and we were bouncing echoes [from] 20,000 yards. Then there was a scanning sonar which we developed.

The only way I helped them when I got to be senior was wheedling money out of my buddies in the engineering [the interviewee later added "and financial"] world. You know, there was only so much money but it was a matter of deflecting it the right way. Dr. Zimmerman was great at getting money for his department, his DRB. So that was a great thing that the Royal Canadian Navy and DRB did. It was one of the very few programs apart from the [helicopter] haul down system and putting the helicopters into destroyers. That was another major thing that we initiated, and of course the gas turbines. We didn't make the gas turbines, but we made in Canada all those other things. Westinghouse made the sonar, somebody else, Fleet Aircraft made the haul down system I think. They were real Canadian things that were in the front of the technology in the world. I'd just like to mention that.

INTERVIEWER: That was something noted that the DDH 280's, all those were brand new technologies and usually it has been said that navies don't like to put too much into a ship that is all new because of the expectation of not being able to make it all work, but we managed to do it for the 280's.

WELLAND: Whether it was clever or not, I was very much a part of that. We really made a huge jump ahead in warship technology with that ship. You know the gas turbine, the towed sonar, the helicopter haul down and there were other things that were coming along. By that time, the domestic feeding and care of the crew had been taken care of so we didn't have to waste our time on that, but the weaponry was really good. Mind you when the integration or unification of the armed forces came, the Defence Research Board was scrapped. Essentially it's coming back a bit, but as far as I know we have done nothing original since. As far as I know (Maybe in communications).

INTERVIEWER: We've done something in infrared surveillance at one time.

WELLAND: At that time we were most active and had dozen excellent scientists, leaders of the world in their field. Anyway, enough of that 'how good we use to be'. I'm sure people are just as clever now, without handfuls of money [the interviewee later added "and high morale"] you can't do much.

Just going back to the rumour that went around that the ship was designed on the back of a cigarette box by me. Absolute garbage! The years of work on that ship, I think we'd been stewing and waiting for the government to make their mind up about whether to accept the ship or not. There'd been endless briefings and buckets of arguments, and I think a gap went by of several weeks where nothing was happening until finally it was decided; the government said, "OK, go

ahead". This was the Treasury Board...the chief obstructionists said, "Go ahead". Of course a bunch of orders were issued and so on. We were all gung-ho and I don't know somebody may have written on a cigarette box,"Go for the GP Frigate", but it sure as hell wasn't designed on a cigarette box, but it's a good story.

INTERVIEWER: So at that stage the ship had been basically encapsulated and the requirements were all sown up.

WELLAND: Yes and all drawn out in great detail by, I think, Sam Davis [who] was running the design department. I remember going over the design in some detail. I found a 300 horsepower diesel emergency engine within about 30 feet of a sonar dome and it struck me 'is that really necessary?' I had a lot of arguments with the constructors and I usually came out with my tail between my legs because I didn't know what I was talking about, but on this one I remembered the constructor saying 'how the hell did that diesel engine get there?' So it was moved to somewhere else. This was the only time I won an argument with the engineers [the interviewee later added "apart from the gas turbine"].

INTERVIEWER: Thank you very, very much Admiral Welland for this. These were great stories and a great deal of insight into a lot of the activities that went on behind the scenes that we would not have known about in any other way.

WELLAND: Well, these events that we're talking about happened a long time ago, but I think what I have said would bear quite a lot of scrutiny. They are probably correct because at the time a lot of them were engraved on my heart along with the disappointments. The Navy were doing great thing in those days, we were extremely progressive and technically as good as any other navy. We set the standard in anti-submarine warfare, we really did. Not only in the ships but in the aircraft as well, so we did have something to brag about and if I sound braggish here, well so be it.

Anyway, thanks for going to the trouble to come and see me.

INTERVIEWER: You're very welcome. This is the end of the interview.

TRANSCRIPTION ENDS