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INTERVIEW TRANSCRIPT

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INTERVIEWEE: Stuart M. Glen

INTERVIEWER: Peter Mace

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Stuart M. Glen

Interviewed 26 January 2006

By Peter Mace

INTERVIEWER: Canadian War Museum Oral History Program Interview with Stuart Glen, recorded on 26 January 2006, at Ottawa, Ontario. Interviewed by Peter Mace. Tape 1, Side 1.

GLEN: My name is Stuart Glen—G-L-E-N.

INTERVIEWER: OK. Just to confirm, Stuart. We have both signed the legal release. Is that correct?

GLEN: That is correct.

INTERVIEWER: OK. Well, I'd like to welcome you here today. To begin with, was there any military history in your family, before you joined the navy?

GLEN: Yes. The primary influence, in that regard, was my uncle, who is still alive in Vancouver. He was in the Royal Navy during the war, and he was living with us when I was a young boy. I grew up listening to his stories of the Royal Navy and the war. He taught me port and starboard, and I watched him build models of Victory. So, when I was seventeen, when my father who was looking at me and a little bit dispirited that I had no intentions of getting of getting a job as a seventeen year old, Dad came in one day and he said, "Congratulations, Stuart. You've got a job, son." And he threw a newspaper down and it had the Army Reserve, Air Reserve, Naval Reserve circled. Essentially, it was a choice of "pick one." So, based on my uncle's influence, and all those stories, it was the Naval Reserve I chose. He was the most immediate. I had others in the war at various times, but he was the one that was the major influence.

INTERVIEWER: And what year was that that you joined the Reserves?

GLEN: That was in June of 1979, and stayed in the reserves, transferring to Reg force in April 1980 – in Reg force until 1990—October 1990. Out for two years; back in, in July of '92, until August of 2005.

INTERVIEWER: What caused you to join the Regular force?

GLEN: Three days into Reserve, I knew that was what I wanted to do. I can't explain it. It was just – I was like dragging a cat across carpet to get there—claws out. But once I was there, within three days… There was an officer at HMCS YORK in Toronto, which was a reserve unit led by Lieutenant Pelee. He was—three days into it, he gave us a little slide show on his career

in Reg force, and it included times in submarines and it was also showing slides of everything there. I was just utterly fascinated. From that point on, I knew. Just every day, the enthusiasm just grew and grew. So, in April, I transferred over.

INTERVIEWER: Where did you do your basic training?

GLEN: In Reg force basic training?

INTERVIEWER: Yes.

GLEN: CORNWALLIS.

INTERVIEWER: And what branch did you go into?

GLEN: It was the Navy and it was by trade, naval weapons tech – at that time, what was underwater, but…

INTERVIEWER: OK. How was that decided—that you went?

GLEN: At the time, it was all pure by our choice. We just missed out. I remember hearing other guys talk how they, you know, they'd walked into a room and essentially, they were told, "This is the trade you're going to be." At the time I got in, it was purely by choice. It was a range of professions that were available at the recruiting centre. Trades—you chose which one, from a list of three. I got my top choice.

INTERVIEWER: What did you choose?

GLEN: Submarines. I wanted to go with submarines, so weapons tech underwater was the trade that I picked.

INTERVIEWER: To get there.

GLEN: Yes.

INTERVIEWER: OK. And did you go straight into submarines?

GLEN: No. I was on HMCS SAGUENAY for ten months and loved it. We went down to Bermuda and we did a NATO over in Europe. I was enjoying myself a lot. Then, one day in, probably about June of 1981, I realized—I remembered I had come into the navy to join submarines. I realized if I didn't do it now, I never would. So, when I got off—that was, you know, one of those three o'clock in the morning on-watch revelations – I went down and wrote up a request form, submitted it in, and my boss promptly sat on it for two and a half weeks, just to see that I wouldn't change my mind. Put it in there and from—that was it—submarines the entire time.

INTERVIEWER: OK. And how long did it take you to transfer off SAGUENAY into submarines?

GLEN: That was about June, when I put it in-ish, and it was early August when I got onto my submarine course, as SAGUENAY was sailing for a deployment over in Europe.

INTERVIEWER: Tell me a bit about the basic submarine training that you had.

GLEN: Compared to what we have today, it was a bit on the rudimentary side. It was up in the Admin building in STAD, on the second deck. There were two instructors. There were two or three different classrooms. There were seven of us on course. Essentially, really, there was very little chance you were going to fail. It wasn't a challenging, difficult course. For those—we had one French guy who had language difficulties, so there was great help, you know, in assisting him pass, because they needed submariners, of course. But yes—that was the training. It lasted—it was from August until October—October 14th. That was in two weeks leave. So, I went on to ONANDAGA.

INTERVIEWER: Was there a problem, in those days, getting people to serve on submarines?

GLEN: Not really. I didn't think so. It was a volunteer service and there was certainly enough to man all boats. They later went to "volun-told" but that wasn't for a few years. In my opinion, one of the things that exacerbated the problem was, sensing they were on a slippery slope in terms of volunteers; they made a real tight grip of the people that did come on submarines—the standard joke being, "Once you've got your dolphins, you've got them for life. No matter how far you run, we'll get you back." The downside to that, of course, is when people who are forced to stay, they get very antsy, and they pass on to all their friends, "So, whatever you do, don't come to submarines, because you know, it's a one way valve." So, that exacerbated the problem.

INTERVIEWER: What year is this, again, that we're talking about?

GLEN: That generalization I made is the period from about '84, I would say, to – probably up to the '90s. But at the time I joined, it was certainly all volunteer. It was – as far as I was aware, they had no lack of people.

INTERVIEWER: Where did you go after your basic training?

GLEN: Basic military training?

INTERVIEWER: No. Sorry. Basic submarine training.

GLEN: I went on to HMCS ONANDAGA and that was October of 1981. That was just before she entered her mid-life refit—super refit. So, I was on there from October until December. Then, in January—December, ONANDAGA went into refit—January to May of '82, I went on my TG4 course.

INTERVIEWER: OK.

GLEN: Tray Group 4 course?

INTERVIEWER: Yes.

GLEN: OK. What was your initial task or job on ONANDAGA?

INTERVIEWER: ONANDAGA? Low man on the totem pole—ordinary seaman weapons man—essentially, it was just to learn. My primary task on the submarine, at that time, was to qualify. You had six months to qualify. My own laziness torpedoed me from getting ahead of the game. I was actually quite ahead on the qualification. I had four months done in that small two month window we had. My department was really pushing me to qualify. It was my own laziness. I had a fourth month walkthrough at the end of it, and I would have been able to finish, had I not—it was on a schedule for a Saturday and I just didn't feel like coming in, and that was that. So, I ended up not getting qualified until the next submarine I was on.

GLEN: What does the qualification consist of?

INTERVIEWER: Then and now are different, of course. So, the qualification then, and the qualification now, are different, of course. Then, you were given a book—a small, yellow book – divided into six months. Actually, my generation was just when this program had started. Previous to me, it was a seven month program. It was a lot more detailed. They had taken a huge chunk of that out, resulting in the book that I was given. You had six months to do it. Ironically enough, after my generation, about two or three generations of submariners after mine, they went back to that original book. So, it was a little window where I dipped in there.

You essentially had—[clears throat] excuse me—month one, was all the very rudimentary—the basic compartments and the basic fittings throughout the submarine. Then, as each month progressed—[clears throat] excuse me—as each month progressed, you had more and more systems knowledge. At the end of it, you had walkthroughs with an officer. Then, at the very end of your six month program, you had three walkthroughs—one with the Coxswain; one with the Chief RA and one with the XO, at the end of which you were qualified in submarines.

GLEN: And at that stage, you got your dolphins?

INTERVIEWER: Yes. Provided you passed.

GLEN: OK. What rank were you in the Navy at that time?

INTERVIEWER: Ordinary seaman. I think I had able seaman in – when did I get them? I think about December—ordinary seaman/able seaman round about that time. Yes.

GLEN: Well, tell me about your career in O-boats, after you got qualified.

INTERVIEWER: In what regard?

GLEN: Which boats were you on, and how long did you sail?

INTERVIEWER: Well, we would deploy—first off, I was yanked from boat to boat as necessary. Essentially, I was on ONANDAGA, as I said, from October to December, went away on course until May, came back and on to OJIBWA. She was just coming out of her midlife refit. In September we sailed for workups over in UK. That lasted until December. Big storm coming back—a BIG storm coming back. The boat was lucky to come through that one.

We got back in December of '82, and then, in'83, still on OJIBWA, we did a deployment down to Florida. Then, we did some night lookout local exercises off the coast. I can't remember what else we did in '83 then, but in '84, was still on OJIBWA. We went to exercises off Gibraltar, and then, up off Norway—the Arctic Circle—was it the Arctic Circle? '85—still on OJIBWA and then, ended up getting transferred on to the ONANDAGA from '85, and stayed there until I went on course again, in 1986.

INTERVIEWER: OK. Let me stop you there, and come back to your crossing where you mentioned there was a big storm. Tell me about that.

GLEN: When we left England, our workups were over. We'd be whopping around a few ports in England. We were transiting back. It was late December '82. My memory—I don't know how accurate I am, in terms of how much knowledge I knew at the time, as to the real – what was going on, but I remember the stories we understood. It was essentially – we were hit by three storms, one after the other. ALGONQUIN was in England at the time and she sailed. We left from Chatham and she sailed. She sailed after us, and got back home before us, of course. She ducked down via the Azores and came up, and we went straight through it.

It was essentially—it was like seven days where it was like being on a Twilight Zone episode. We were always seven days from Halifax. The intention had been to go into St. John's, clear customs and then make way our back to Halifax. But as we kept getting bogged down, we lost a day. Then we lost another day. Then we cancelled St. John's and we lost another day. Every day we woke up, we were always seven days in Halifax. It seemed as if we were making no progress.

We took heavy damage on the casing. We had the mast stimuli[?] broke off and sections of the casing were missing. The array—sonar array windows were smashed and gone. I just remember a few guys were injured—guys falling out of their bunks, and things like that. I remember at one point, being on watch, up in the forward computer room. It was very bizarre. Guys were sleeping as best they could. You can't really sleep in there. You just rest, essentially, for a few minutes at a time. But the boat rolled to port.

I was sitting at the pedestal, and gripping myself, holding myself in and the boat rolled heavily to port. Then, it just seemed to hover. It was almost like everyone throughout the boat—you could just sense that everyone was waking up. Then, the boat rolled again, further and further to port and then, stopped and then, rolled back to starboard. It was just for a moment there—we were right on the balance. As you go along, you get a sense that, you know, "Everything's fine.

Everything's fine. We're bashing around but we're safe." But this was past our comfort zone, and it was just one moment and then, it was gone and that was over.

INTERVIEWER: Was the transit made totally on the surface?

GLEN: Yes, I remember, too, the Captain—Lieutenant Commander Norm Nicholson—he offered us – the crew – a choice. It was essentially – we could sail back on the surface and risk the weather, or we can make a dive transit and seek opportunities for snorting, but that would be longer. Not that he gave the crew, you know, a vote, but he said, "What's the general feeling throughout the crew?" Everyone was just rabid to get home, of course. So, naturally, we'll take the quickest way. You know, Mother Nature's got nothing on us, right? It was—the choice ended up proving, I think, in that reflection, a rather poor one, because we really hit those bad storms.

INTERVIEWER: Were you going straight into the storm?

GLEN: I'm not sure. I imagine we were. Obviously, there would have come a point where we were steering into the weather, rather than steering a course for home. But I do remember one occasion, looking out the search periscope, which was fully raised, and if memory serves correctly, it was 67—67 feet from the keel—the tip of the periscope—and just seeing just a solid wall of water. The waves were higher than the search periscope was raised. And then, a second or two later, we're up on the crest, and you're looking at this huge valley down below you. Yes—it was pretty nice.

INTERVIEWER: Would you have had somebody on the bridge throughout this—on the?

GLEN: We had him for a degree—for a portion of that, we did. But there were – we had guys flooded out up there. They were all wearing their life harnesses, their safety harnesses. But then, the Captain said, "Clear the bridge. Come below," because it was just too dangerous. Guys were, you know, in jeopardy up there. So, that was for a day. But you don't want to do that, even in that weather, for any length of time. That was only for as long as it was necessary.

INTERVIEWER: I guess that allows me to ask you to compare the surface capabilities of the OBERON, say, to the VICTORIA Class.

GLEN: VICTORIA class seems to roll a bit more on the surface. They're designed for underwater. There's no huge difference leaping out at me, though. They're faster on the surface—the VICTORIAs are, than OBERONs were. But they both are…

INTERVIEWER: VICTORIAs are faster on the surface?

GLEN: Yes, they're generally—yes. We can do a bit faster and maintain a higher speed, higher raceway[?]. But essentially, they're roughly the same.

INTERVIEWER: OK. So, go on with your—I guess we're up to about '85-'86.

GLEN: Yes. Then, I went on my – ’86, I went on an eighteen month tech course at STAD.

INTERVIEWER: What rank were you at this stage?

GLEN: Sorry, actually that was ’87, I went on that course. By that point, I was leading seaman, going on to master seaman. That was from—sorry, it was ’87. I was on ONANDAGA from ’85 to ’87. Then, we went on course. That was eighteen months. Then, ’88, I came back into—by the way, when I went on course, that was it. I had enough of submarines and that. You know, this is just too much. So, I went on course. Like an idiot, I said, “No, I’m not coming back.” And I didn’t get to keep my submarine allowance, which, if you—you could sign a paper saying you promise to come back, and you get to keep your submarine allowance for the duration of your course. Like an idiot, I said, “I’m not coming back.” Then, I ended up wanting to come back when that eighteen months was over. So, I came back and that was onto a—what boat was that now? They all seem to blend together. I think it was ONANDAGA.

INTERVIEWER: How much was the submarine allowance in those days?

GLEN: I can’t remember. Now, it’s up at about six to eight hundred dollars a month. But then….

INTERVIEWER: So, seven, eight thousand a year?

GLEN: Yes. Then, it was, I think, about three fifty, is coming to mind-ish. But again, it changed. We got – every year, we’re getting incentives and things.

INTERVIEWER: So, you stayed with submarines through until…

GLEN: Right up until—even when I – I was out of the Navy for two years, I was still a submariner in my mind. So, yes, right up until August 2005, when I retired.

INTERVIEWER: What was there anything in that period of – before you took a break that sticks in your mind about anything that happened of interest, in that period of time?

GLEN: I’m sure if I thought about it—I could—you know, things that were of interest. There was certain things we did that I can’t really talk much about. There were other memories of port visits and friends that come in and out of your life, and guys that passed on. So, there’s many, you know – on the personal memory front, there’s many little bubbles of memory that I could grab and explore, at various points.

INTERVIEWER: What rank did you reach?

GLEN: Petty Officer Second Class.

INTERVIEWER: OK.

GLEN: Yes.

INTERVIEWER: What's that equivalent to in the Army?

GLEN: In the Army, a Sergeant.

INTERVIEWER: Right. And what would your main responsibilities have been at that stage?

GLEN: Responsibility—at that time, I was called a Torpedo Instructor—TI. It's the senior naval tech on board. He's responsible to the Combat Systems Engineering Officer and the Combat Systems Engineering Chief, for the proper running of the naval weapons tech section, which involves the operation and maintenance of all the torpedo tubes and submerged signal ejectors on the submarine, and the safe care, custody and handling of all the ammunition and accounting—emission accounting—on board. Of course, he's got divisional aspects for the people that work underneath him.

INTERVIEWER: OK. What kind of torpedoes were being used at that time?

GLEN: When I started, we were using the Mk 37 torpedo—the US Mk 37. Around about '87-'88-ish, we converted over to the US Mk 48, which is the same torpedo we have on board the VICTORIAs these days.

INTERVIEWER: OK. You mentioned you left the navy for a couple of years. When was that and why was that?

GLEN: That was October 1990—got out—and got back in, in July '92. Essentially, I was—like again, I realized, you know, again, that I've always wanted to go to university. I realized if I didn't do it, then I never would. So, I chose to do that. Then, the usual story—not applying myself, running out of money, missing life on the boat – staying in Halifax and seeing them every day. So, in 1992, around about February or so, I called up squadron and asked if there was any room for an [indistinct word] coming back in, and there was. So, I got back in.

INTERVIEWER: OK. What happened—I guess we're now up to the early '90s. What were the conditions of the O-boats in those days?

GLEN: It's all a matter of perspective. It's all relative to those of us that served on them. They were marvelous boats. The conditions were perfectly acceptable, but to the next guy coming along—he might look at in horror and say, "How could you live in that condition?" To us, it was home. We knew every nuance and every subtlety on the submarine. We knew all the people. We sailed with them, year in and year out, in different boats, different faces. So, it was—looking back on it now, the living conditions were a bit harsh; in terms of we were under severe water restrictions.

In fact, at one point, in 1984, on the Norway trip, it was the longest I have ever gone in my life without a shower or bath of any sort was forty days, on that Norway trip. That was pretty bad, even [laughs] for a submariner. I remember my legs had scales. They had gone past the dirty

stage. But obviously, that was middley rare?. We also got updated with what they called a reverse osmosis distiller, which allowed us to generate a lot more water on board.

Of course, VICTORIAs these days, they're begging us to use water, because they're coming up leaking out our ears. So, yes, conditions on board were—the food was either excellent or sad. It depended entirely on who your cook was. The Navy supplied lots of good food. Usually, we had good cooks—sometimes, outstanding cooks. You always had the usual coffee you want. Yes—so, it was not too bad.

INTERVIEWER: How—on an average year, how many days would you be away from Halifax?

GLEN: Depending on what that average year was. It started out really bad. At one point, it was like ten months out of the year, we were away. That was really bad. Then, they brought in a limit. They said the submarines couldn't be over – and ships, in general, I believe – couldn't be away any more than a hundred and fifty days a year. But we found, to our disappointment but not our surprise, that they would very liberally stretch that.

They would say, "Oh, well. You know, just sailing off Halifax—that doesn't really count as being away. You know, you're still in the coastal waters." So, that would end up – that hundred and fifty days, which the crew naturally would take one extreme—right? And the Navy would take the other extreme. So, generally, it tended up being a bit more than a hundred and fifty days. But it was—from that perspective of family, it was good to see that there were some limits put on it. But early on, there was not. There was a lot of time away.

INTERVIEWER: OK. So, it got better in the '90s?

GLEN: Yes, it got better in the '90s. Yes.

INTERVIEWER: When we talked about the boats, how was the maintenance—how were you able to keep up the maintenance on a weapons system that was as old as this one?

GLEN: We had a lot of crew—not only for a submarine, but for a weapon system. We had enough to do the job. To be honest, we weren't really as diligent on maintenance as we could have been, and certainly nowhere near as diligent on maintenance as we are now with the VICTORIAs. If I had a department full of me, on a VICTORIA—me, as I was then—as a CSE Chief, I'd be dropping on them like a bag of hammers. We knew what the maintenance were. It's just how you grew up—rather, you'd get bosses that teach you, and you see with your eyes the consequences of not doing maintenance. You get other bosses that don't.

In the particular environment we were in at the time, maintenance was done. It depended what boat you were on. Some people would be really diligent. Others wouldn't. I know myself—it's a big education. That was an education to me. There was a period of time when the torpedo tubes were—their doors were always leaking water. I thought that was normal. It was only when I went onto another submarine, and got taught the maintenance that you were supposed to do, that I realized that's far from normal. That's, you know, clearly abnormal. These things are supposed to be tight. So, everything is an education and that was one more.

INTERVIEWER: But in through the '90s, was it still possible to get the parts and so on?

GLEN: Yes. And they purchased HMS OLYMPUS, for use as a harbour training submarine. That was—despite the "We won't cannibalize it. We want it as a school". That, you know – if you needed something and that was over there, you'd get it by hook or by crook. But also, they purchased HMS OSIRIS. That was a submarine they purchased in UK, that the RN had retired and we bought it for parts—cannibalized that—put it in a hundred thousand boxes and sent it off to Gladstone. So, we had that if we needed it.

INTERVIEWER: Why did they finally stop running the OBERONs, then?

GLEN: They had intended to run them a bit longer, but when the UPHOLDERs finally became a realistic possibility, they couldn't run them both. One—we needed to run them to a degree to train people that we would need for VICTORIAs, but the cost to keep the boats was just astronomical, at the end of their life. That money could better be used elsewhere.

INTERVIEWER: So, what years were they finally retired?

GLEN: I left ONANDAGA in 1999 to go to UK. I think she ran for another year or so, and that was the last one. So, it would have been '98-ish that OKANAGAN finished and OJIBWA finished. Yes, but ONANDAGA ran a little bit longer, as I said, to train the people that would be needed for [indistinct].

INTERVIEWER: You went straight to the UK to stand by the boats?

GLEN: Well, I went to the UK. I was on the second wave. The first wave went over in early 1999. That was to – they would become the crew of HMCS VICTORIA. I was on HMCS—the boat that would become HMCS WINDSOR. That was in October 1999. It was originally supposed to be about fourteen months in my case. It depended on your trade—the length of time you would be there. But in my case, it would be fourteen months. But of course, the submarine program was beset with delays, and as it turned out, my fourteen months turned into six years. So…

INTERVIEWER: Six years in the UK.

GLEN: Yes. A bit longer than otherwise expected, but that's because I went from WINDSOR—brought her back and that was it. My time in the UK was over. That was two and a half years or so. The time the UK was over, I was back in here—back in town, in Halifax. I got posted up to the Canadian Forces Naval Operation School—the Submarine section—to be the senior naval weapons tech there. That was only that—in fact, I still have my year routine in my pocket. It was incomplete.

When the Career Manager visited, he looked at me and said, "I'd like to talk to you about England." I was taken completely by surprise, because I had just come back—had just bought a vehicle. So, as it turns out, I went back, shortly – a few months after that—put the vehicle in

storage, furniture back in storage again and back over there. And that was to go on to CHICOUTIMI. But CORNERBROOK was ramping up and her CSE Chief had put his release in. So, about a week before sailing, me being over there, and obviously available – that was only for two months, that turned into ten, again with delays. But an incredible education—I mean, I saw everything that could possibly happen.

So, by the time CHICOUTIMI came around, I had had a good experience on there. Then, of course, CHICOUTIMI lasted right up until we sailed [in] 2005.

INTERVIEWER: So, as far as the crews were concerned, was there any dead time between the OBERONs and the VICTORIAs?

GLEN: Well, dead time—yes, for many years, when we had no submarines sailing. But that wasn't dead time, in terms of training. We were still over in the UK learning our new boats. For guys that were back in Halifax, that were not training—that were not part of the UPHOLDER program, that would have been major dead time for them. There's really—at this point of time, there's the two groups. There's those of us who did the UK training, and those that didn't.

Right now, it's visible, obviously, between the two, because we haven't had much chance to send the new boats out, to train those guys that had stayed behind, although we are making progress. So, those of us who were in the UK have the oodles and bucket loads of experience, but as time progresses, that will—you know, those of us who did the UK will dwindle in numbers, and those that are trained purely in Halifax will overtake.

INTERVIEWER: At that point in '99, I guess, what rank were you were and what position were you in?

GLEN: I was P2. I had been up in CAPE SCOTT in the underwater weapons engineering section. From there, ONANDAGA had a need to go down and fire torpedoes down south. Gordie Hamilton, the Squadron Coxswain, at the time—it was my turn, essentially, to go back to sea. So, I went onto ONANDAGA, kicking and screaming all the way, and took ONANDAGA down for a torpedo shoot in 1999—the spring of '99—which, again, is what appears at the time to be, "Oh, Gordie. I've got to go back to sea. How many years have I done? Now, I have to go back." Mr. Whine.

Then, it turned out to be a blessing in disguise, because it had been about ten years since I had actually done a torpedo firing. This was just excellent, which was right back in and getting all the little subtleties that I had forgotten about. I re-learned, in the course of doing things. So, I was primed for going over to the UK, as current as I could have been, having just fired twenty-four torpedoes down south. So, that was nice.

INTERVIEWER: This was testing the 48s?

GLEN: Yes, that was also—yes, testing tactical development and crew training and doing weapons certification.

INTERVIEWER: OK. Let's talk about the differences, as far as the crew was concerned, between the OBERONs and the VICTORIA class.

GLEN: There's less crew on a VICTORIA class. There's more room on an OBERON, surprisingly. The VICTORIAs are larger submarines. They have two decks, whereas OBERONs only had one. But there's a lot less room, and it's startling, when you think about how this could work, especially considering that there's less people. But in an OBERON, the crew was spread throughout the submarine. They had bunks everywhere—essentially, in every compartment. That meant there were only little pockets of ten people here and there.

In the VICTORIAs, everyone lives in the one section and they work, essentially, in that main area of 40 to 56 bulkhead. There were only two guys going aft of 56 to work. So, everyone's concentrated in the one area. So, it makes for a constant, "Excuse me. Excuse me. Excuse me." Twenty-four hours a day, seven days a week, essentially.

The crew of VICTORIAs, in my opinion, are far more educated about their submarine than they were in OBERONs, and OBERONs were already a high degree of education about their submarine. The qualification—training program we've had, has always been excellent, in my opinion, in really learning your submarine, from one end to the other, regardless of what trade you are. Whether you're a weapons tech or whether you're the steward on board, you all have to know it to the same level. In the VICTORIAs, though, that is so much more enforced and learned, right from the get go—drilled into you.

INTERVIEWER: What's the reason for this?

GLEN: They are a lot more technically complex submarines. In OBERONs, there was a safe, warm, fuzzy, comfort feeling you got from the big mechanical clunky bits that you had all around you. It was mechanical. We complained about that at the time, you know, "Jeez, there's got to be better ways to do this. British submarines, man!" You shake your head. Now, looking back on it, there's a great solidity in a big strong brass piece that you know is not going to—it's not filled with electronics that are, you know, delicate and easily… So, yes—there was that aspect of it primarily.

INTERVIEWER: OK. Back to the crew comfort, I guess—how would you—just expand on that a little more. You just mentioned the space—that it was more crowded.

GLEN: To give you an example, the Chief and Petty Officers' mess on a VICTORIA class submarine, there's room for about six guys, seven guys to eat, and there's about twenty-three Chiefs and POs on board. So, seven or eight eat at the one time.

INTERVIEWER: Where do the other eighteen go?

GLEN: Half their number are on watch—the other guys that are off watch. But that leads to – like a pack of hyenas on the Serengeti—staring. They're out in the passageway, because there's no other place for them to stand or sit. So, they're standing by 35 bulkhead, hungrily looking in

at all the guys that are—like, the on watch—guys that are about to go on watch. So, they obviously have first priority to eat.

So, those guys are in there, lording it up. You know, they've got their juices. They've got their coffees and their steaks. You're waiting out there. And it's just packed. It was just solidly packed with people—bodies. To make matters worse – it's changed, but at the time the smoking area was down in the mess wall, and its entrance was right there. So, you had a constant stream of people coming in and out of the mass wall, because you're only allowed to have, I think, two or three guys down there at any one time.

So, you know, you had the waiters for the mass wall. You had the waiters for the mess in an area only two feet wide at its widest point. In addition, you had a sink there. So, that's where the Chiefs and POs did all their—on OBERONs, we had a mess man. But we don't on the VICTORIAs, so we all—we'd do our own. So, essentially, you have guys out there that are doing the dishes and drying the dishes, as well. So, it was very packed. And there's three meals a day or two meals a day, really.

INTERVIEWER: How many messes are there on the submarine?

GLEN: There's three. There's the Chief and POs'; the junior ranks', who had the largest—obviously, they have the most numbers; and the wardroom, itself.

INTERVIEWER: OK. Now, does everybody live in the messes, as well?

GLEN: Yes. They have their sleeping areas on these boats are separate from the messing, which is an excellent thing. On an OBERON, the living area and the sleeping area were the same, which made—you know, if you want to watch TV, you know there's someone silently fuming in their bunk, just two feet away. Too bad, too sad. Unless it happens to be me. But the guys that are—and on here, their sleeping area is in a completely separate area, and a line for a mess. So everyone stays, essentially, in your mess. Visiting other messes is not a common thing because we all like our space and we all need our privacy to get away, so that we can complain about the other two. Yes—so that's essentially it. You're either on watch or in a mess.

INTERVIEWER: Does everybody have their own bunk?

GLEN: Yes. That's a point of pride in Canadian submarines. Hot bunking would be… Me, personally, I've got no objection to it. A lot of submariners don't. But other submariners do, and we respect that. Hot bunking is only—just for clarification purposes, hot bunking is when one person has a bunk—he's sleeping. He gets up to go on watch. Someone else comes in behind him and uses that. So, everyone likes to have their own.

It's amazing how that the whole culture of privacy has developed. People are asleep in your bunk—you've got a curtain. That's all that's separating you from—and again, from the one foot wide passageway, in the bunk spaces. That curtain is sacrosanct. You never come up to someone's curtain, and just yank it back and start talking. You know, you'll either knock in air and say, "Knock. Knock." Or you'll, you know, find some metal protrudance to bang on, and

they'll open their curtain, and you can talk to them that way, because no one violates the sanctity of privacy.

INTERVIEWER: OK. So, tell me about CHICOUTIMI. What did you join her as, and where was the crew from?

GLEN: Well, CHICOUTIMI—I joined her from—coming from the school, as I said earlier, go over to CHICOUTIMI—and I was right into the position of Combat Systems Engineering Chief. We call it CSE Coordinator, on a submarine. That, essentially…

INTERVIEWER: Let me ask you about that position. What was that position responsible for?

GLEN: OK. Well, what that was responsible for—there's two people—the submarine is divided into four departments. There's the executive, which consists of the executive officer and the coxswain and the cooks and doc. There's the mechanical systems engineering section—the stokers and the electricians that run all of the mechanical systems throughout the submarine. There's the operations department which runs the—they're the sonar operators, radar operators, etc. There's the combat systems engineering department, which was the one I was in, that was responsible for all the combat systems on board—all the maintenance of all the sonars, all the radars, the weapons systems, etc. etc. – all the radios.

So, that department—the combat systems engineering department—has two people running it—the Combat Systems Engineering Officer, or CSEO, and the Combat Systems Engineering Chief, which was the position that I was in. So, essentially, I had four sub-sections—sonar; tactical, which would be the fire control side; weapons, and communications; and each of those sections has one or two people in it. So, the job was multi-headed in that you had—whereas, you know, my whole training has been weapons. Now, suddenly, I'm responsible for sonars and radios—the things that I normally had no experience with.

But you're in charge, essentially, of the day to day activities of each of those techs. They come to you—the Section Heads will come to you—and say, "This is what we're working on." "OK. This is what I want you to work on. You filter it in to your job plans and get back to me." You supervise the maintenance for the whole section, and things like that.

INTERVIEWER: What rank were you at this stage?

GLEN: By this stage, I was a Petty Officer, First Class.

INTERVIEWER: OK. Even though you were called the CSE Chief.

GLEN: Yes. The CSE Chief, just for clarification sake, that's the position. Submarines always do what ships do, but you do it one rank less. The head of the weapons section on a ship is a P1. It's a P2 on a submarine. The CSE Chief is a chief onboard a boat, but it's a P1. I think we shortchanged ourselves by calling it CSE Coordinator. Someone somewhere thought that would have been a good idea. The downside is that people tend to—you know, they don't—the job is exactly the same.

I mean, my job on a submarine is the same as the equivalent on a ship. They have the four sections to run. They're responsible for the same maintenance that I am, and blah, blah, blah. So, the position is the same. So, there was a little back wave motion of getting it changed to CSE Chief.

INTERVIEWER: What's the total crew on a VICTORIA class?

GLEN: Fifty six-ish. Fifty six, fifty seven-ish would be—why don't you quote me at fifty seven.

INTERVIEWER: And how many in your division?

GLEN: Ten or eleven, I think, without counting them through. There was…

INTERVIEWER: Counting yourself?

GLEN: Yes. That's all of us. There was the CSE, myself—that's two. There was two acoustic—that's four. Three weapons—that's seven. Two tactical—nine; and one com—ten.

INTERVIEWER: Now, these folks stand watch, as well as do their maintenance jobs?

GLEN: Yes. All sailors do—the only exception to that, being the Captain. Yes. We stand watches in various locations. There's a watch keeping position at 35 bulkhead, which is responsible for all systems 4 to 35. There's—some of us were in the helm rotation; others on the fire control. That's when we're dived.

When we're on the surface, there are those of us that are on the lookout rotation—the helm lookout rotation—and those of us that are on the plot. So, depending on whether the submarine is on the surface or dived, we have a different place we stand watches.

INTERVIEWER: So, at sea, what's the average working day?

GLEN: Twelve hours. It's—we're one and two—all the time, monitoring these boats. We're all one and two, with the exception of….

INTERVIEWER: What do you mean—one and two?

GLEN: OK. One and two means you're six hours on; six hours off; six hours on; six hours off. Now, the exception being on the surface, when we go to a more relaxed watch state. It's a little bit of a bonus there, especially for those of us on the plot. There was a lot of us, and only a couple of hours at a time. But for the most part, we were one and two at sea.

INTERVIEWER: Now, but if you're on watch for six hours and off for six hours, do you then do any maintenance?

GLEN: Yes. Guys that are on watch will do maintenance. Guys that—if they need a hand, guys that are off watch do maintenance. But the general philosophy is if you're off watch, get your head down if you need it. One of the beautiful things I love about submarines that—as opposed to ships—we don't have any of this, in my opinion, silly hands to cleaning and to night clothing. You're not allowed to go to your bunk during the day. You've got to stay up and do work. None of that—if we need to turn to a department, we turn to that department. Everyone knows the drill. But if you're not, you're free to get your head down, twenty four hours a day, when you're not on watch. So, that's good.

INTERVIEWER: Did you stand one and two on the OBERONs?

GLEN: Yes. We alternated between one and two, and one and three. A lot of times, we were one and three. Early on in the career, as we got more and more operational, towards the late '80s, the early 90's, one and two became the norm where, especially—not for any of the stoker types, because they're not allowed to by law. But certainly for those of us 4 to 77 bulkhead on an OBERON, and all the operators—there's sonars; there's recording—not recording—they're monitoring all the sonars, recording all the exercises, and things like that.

INTERVIEWER: And just one last question—how did you find one and two, versus one and three?

GLEN: My preference is one and two. A lot of guys have that preference—one and two—because you're either working or sleeping. Time passes relatively quickly.

INTERVIEWER: OK. Interview with Stuart Glen. End of [Tape 1] Side 1.

END OF TAPE 1, SIDE 1

INTERVIEWER: Canadian War Museum Oral History Program interview with Stuart Glen. Tape 1, Side 2.

They start bringing you then to HMCS CHICOUTIMI. When you joined her, what condition was she in and what stage of development was she in?

GLEN: When I first joined the boat, which was in March 2002, visually, she was in horrible shape. The submarine had been cannibalized, essentially, for the other three boats that had gone before her. As they needed bits, there's one sitting on CHICOUTIMI. CHICOUTIMI's not due for another couple of years. Let's take – rob from Peter. We'll order long lead items and get it done in CHICOUTIMI.

Also, being the oldest submarine, being HMS UPHOLDER – the first one of the class that had been built – physically she was in the worst state—big huge rusty bits and pieces of her casing missing and all sorts. So visually it looked, you know, like Sam's junkyard. But appearance isn't everything. CHICOUTIMI benefited from having all those parts robbed off her in that she got all the brand new replacements. She had the most work done in the reactivation and far

beyond what the other submarines, themselves, got. So, when we finally sailed, CHICOUTIMI was, by far, in the best condition of all the submarines.

INTERVIEWER: When you comment on reactivation, what did that consist of, in general terms?

GLEN: OK. What that meant—reactivation was—just the history of the UPHOLDERs. They were purchased—manufactured in the UK, starting in 1987 or so. Right about 1993, there was essentially—the Navy was faced with a choice. You can have amphibious assault ships, which were the ALBION and the BULWARK, which were then on the drawing boards. You can have a nuclear submarine fleet. You can have a diesel submarine fleet. But you can't have all of them. So, you have to tell us what your priorities are.

So, the UPHOLDER class—they had hoped to build, I think it was about eighteen or nineteen of them, for themselves, and to carry on, of course, and export them, as they had done with the OBERONs all around the world. But the ending of the Cold War tended to throw those plans into disarray. So, when faced with the choices, they chose to get rid of their diesel submarines and they put them into storage.

Canada, essentially, as I understand it, dithered for years. Do we buy? Do we not buy? Do we buy? Do we not buy? Meanwhile, the submarines were—had a maintenance package, in that the UK government paid BAE—Vickers Marconi, at the time—to maintain the submarines, in alongside condition, and they were. That was up in Barrow-in-Furness in the UK.

So, along comes Canada—finally decided we're going to purchase these submarines. They had to be brought to a standard acceptable to the Royal Navy. So, this worked in our favour in some ways, and worked against our favour in other ways. Essentially, what the British did is they determined where each submarine—the condition of each submarine was—and, as I said, UPHOLDER was in the worst of the conditions, because she had had the longest running period, whereas HMS UNICORN, the future HMCS WINDSOR, was in much better state. She had only run for a year before being put in that mothballed state.

INTERVIEWER: Had the boat suffered from being mothballed, sort of thing?

GLEN: All of a sudden, you have to—I mean, you've got a metal object sitting in water. It's going to rust and there's going to be bits that—all this mechanical—subs are very mechanical. You need to constantly work and keep things going. It's like a car. Leave it sitting out for twelve years, sitting in your lawn, is going to reflect that. But you have to keep in mind, too – this is a shipyard that builds submarines. So, nothing is irrecoverable, as we demonstrated.

So what, essentially, reactivation was, was determining what state it was in now, and bringing it to the known state of a generic RN submarine of the standard required for taking that vessel safely to sea—not for making it operational, in terms of weapons capabilities and discharge. So, it was to get the submarine at sea, in a safe operating manner to carry out the acceptance program, and then, turn it over to Canada. That was what was done in each of the four boats.

INTERVIEWER: But that's just bringing it back to the "as designed" condition. Were there any upgrades done as part of the reactivation?

GLEN: No, and only—when I say "no", that's with a little asterisk there, recognizing that we were going to be removing the British fire control, which was known as DCC, and replacing it with the SFCS—the submarine fire control system that we had. Also, that we were using the Mk 48 torpedo vice the Mk 24 that they use over there. There were some weapons upgrades. They brought—excuse me – the fire control over to Barrow to test the integration and things like that. So, yes, in that one regard, but for the most part, no.

This wasn't an upgrade. This was a – reactivate to a standard and then, give it to Canada. Then, Canada was free, from that point on, which is why we have this whole Canadianization process that we're doing now. Really, the submarines as they are now, are not unrecognizable, but significantly different, than the submarines that we had when we were in the UK.

INTERVIEWER: OK. So, they weren't Canadianized in the UK, then?

GLEN: No. They were not.

INTERVIEWER: OK. Tell me about the crew that was assigned to CHICOUTIMI. How experienced were they?

GLEN: CHICOUTIMI's crew was the most experienced of all of them. The reason I say that—and I'm a classic example. I mean, I would stay on CHICOUTIMI and I had two previous VICTORIA class submarines. I wasn't the only one. We had many other guys—guys who had been over there for years, with the other programs. As we brought the submarines back, of course, many guys went back to Canada. Some came back over. So, we just piggybacked from one boat to another.

So, on average, CHICOUTIMI had a very high level of knowledge—system knowledge—experience, which I believe was one of the contributing factors, as why we were able to survive what later became, was because we had that high knowledge. Certainly, our engineer, [Lieutenant] Commander Gord Young, was the engineer on CORNERBROOK before that, and was very—and he was pivotal on its arrival.

INTERVIEWER: Of the fifty-six odd people on the crew, was everybody submarine qualified?

GLEN: Yes. Yes. That was one of the conditions. In order to begin your VICTORIA class training, you must be submarine qualified. The British wouldn't train new people, but you would convert your OBERON training to VICTORIA. So, coming into that process, everyone was qualified, but then again, you had to get a VICTORIA class qualification on top of that.

INTERVIEWER: OK. Tell me about that qualification.

GLEN: That consisted of coursing for various lengths, down in HMS COLLINGWOOD in Fareham, UK, off Portsmouth. In my own case, we arrived in October of 1999 and the

classroom training lasted until February of 2000, when we went up to Barrow. There was a series of, I think, thirty-six rotating lectures and that meant every day, you got a lecture. Then, you went down onto the submarine, and they walked you through the systems on the submarine. Within the next couple of days, you had to go back and teach them, essentially, what you had learned. That boat—then, every day, there was a new lecture. This was just a rolling—whenever a course load of people would come up from down south, they just plugged in to whatever day it happened to be. Then, thirty-six days later, they were finished and out of the cycle.

So, at the end of that period, you were, then, taken in and there was a board. You were given an oral board. It lasted about an hour to an hour and a half. That consisted of RN and one Canadian—two RN guys and one Canadian. You were grilled. Of course, prior to that was walkthroughs on the submarine, to see if you were ready for that board.

INTERVIEWER: So, the submarine is being prepared mechanically, electronically, and the crew is being prepared.

GLEN: Yes.

INTERVIEWER: So, what stage do we arrive at, when we are ready to go to sea?

GLEN: Long way down the road. There's a—the portion of reactivating the submarine—keep in mind that Canada doesn't own the submarine at this point. This is the property of the Ministry of Defence, and they have contracted British Aerospace to reactivate it. So, for a huge portion of that, we have no say. We are not signatories to test forms. We have no power, really, to influence things. However, we had power, in terms of, at the end of the day, they have to transfer that submarine from the Ministry of Defence to Canada. OK. So, that's where our power lies, in saying, "We're not accepting this submarine until the following items have been addressed."

So, as we went along, going through this reactivation process, even though we didn't have the power to influence things, they would often seek us out. In fact, as the time grew on, we got a more comfortable relationship working with each other. We had full participation, unofficially. In other words, you know, they could say, "We're really not comfortable with this. How about you take another look at it?" Then, they would either would or wouldn't, depending on the technical merits of the situation.

INTERVIEWER: How long did this go on, then?

GLEN: For CHICOUTIMI's case, well, it went on right from 1999 because the boats were put up. CHICOUTIMI was put up on the lift in 2000, and she stayed up there until she undocked in, I think, December 2004. But meanwhile, other boats were the focus, as we spit the other boats out. Gradually, more and more workers were able to transfer over to UPHOLDER, because the other boats were back in Canada at that point.

INTERVIEWER: Well, then, when was she ready to go to sea?

GLEN: August 2005 was when we were finally ready to go to sea. All the technical issues had been resolved. The crew training had been wrapped up again after, you know, two years, the crew was sitting around. Those of us that are techs, participating in and witnessing tests and trials. Though the operator guys, not really having much to do—so, they were rotating back to Canada, so they could be with their families. Starting in December that year, January, after the Christmas break, the crew gathered again.

The UTT—the UPHOLDER Training Team—the sea training—the lectures all began again, to getting us all back up—all those little subtleties that you forget about. All those lectures started happening again, to get us all up to speed. We had commenced with sleeping onboard trials, and navigation trials and upper deck—getting upper deck teams—all teams put into place, so that submarine would go through the various watches. Like we spent a day on board, going through watches, and setting up and taking out damaged control equipment. Essentially, taking the process of sailors that had been sitting in an office for a number of years – beginning that step by step, incremental – getting them up to where you're fully ready and operational to go to sea. That point arrived in August of 2004.

INTERVIEWER: What happened then?

GLEN: Then, we began—it was a sea phase, as in three phases. Phase 1 was about ten days – ten-twelve days. It's out to sea, primarily doing a series of trials. Prior to that point you have done alongside fast cruising, we call it. That's when the whole crew comes on board. The submarine remains alongside, but you shut the hatchet and you pretend you're at sea. You go through all the watches. You go through three days of fire fighting and flooding and all sorts of stuff, as if you were at sea.

That—assuming you passed – that that is the go ahead to be allowed to take the vessel out, under limited conditions. You're not allowed to dive beyond a certain depth, not allowed to do this—you have to communicate with shore authorities every thirty-six hours to let them know you're safe. So, once we slipped in August 2005, that ten days was with those restrictions in place.

INTERVIEWER: What was she—what was her name? Was she the UPHOLDER then, or was she…?

GLEN: She was HMS UPHOLDER, a unit of the Royal Navy. We were unique in, as all other British submarines or training submarines were, at that point – we were unique in being in the Royal Navy, essentially. All the training and qualifications were to RN standards. We did a complete RN dolphin package.

INTERVIEWER: Did you carry an RN captain of that….?

GLEN: It was a Canadian crew, with an RN captain. A Canadian captain had no command authority, but he was there, obviously, alongside with us, to learn and to observe. In occasion

periods, the RN Captain would let him take charge, of like a diving evolution or something, to give him experience, but under the clear auspices, the RN Captain is in command.

INTERVIEWER: Was the RN Captain an UPHOLDER experienced submariner?

GLEN: I believe so. I'm not certain on that. There were two of them. The first three submarines had Lieutenant Commander David Lightfoot. CHICOUTIMI had Lieutenant Commander Stuart Little. I know Stuart Little had previous UPHOLDER experience. I'm not certain if David Lightfoot did. But in the end, even if he didn't, it was transparent to us, because they were RN captains and fully qualified in every way.

INTERVIEWER: So, how long did this serving in the Royal Navy go on for?

GLEN: In my case, six years.

INTERVIEWER: I mean, from the time you first slipped and went to sea.

GLEN: OK. It was, like, ten days or so that first phase. Then, we went into Campbelltown, Scotland on the Kintyre Peninsula, near the famous Mull of Kintyre. That was for a few days of shoreward period of getting all the defects from the first running period all sorted and out of the way. Then, the next phase was a five-day sea training. This is where we do the full meal deal for five days—the at-sea evolutions. Assuming you passed that, you're then certified to go out on the third phase, which is a lot more trials, but also your deep dive.

In CHICOUTIMI's case, we were the only submarine of the four to not pass that sea training phase, at the time. All this is very subjective. In our opinion, as the crew, that was undeserved. You know as a crew whether you're doing well; whether you're not doing well. We were doing well. We felt we were doing well, at any rate. We should know, because most of us had been on—sort of, on three submarines over there. Whereas the UTT guys and the sea training team that came down – they just saw CHICOUTIMI's guys. So, we had other things to compare. But at the end of the day, we had another two days out.

We cut our second period in Campbelltown short—went out and were scheduled for two more days. After the first day, they said, "That's right. You've obviously picked it up in that one day extra of training." So, we came back alongside in Campbelltown and then, carried on into phase three, which was the deep dive, and Nirvona[?] sound range and things like that.

INTERVIEWER: Now, in this period of time, were we talking what I would call sea-going training or are we talking operational training?

GLEN: Sea-going training. Operational, in terms of basic sonar operations—snorting procedures and things like that – but not operational terms of out looking for enemy units, and you know, CASEXEs with the ships and things like that. So, it was just basic submarine operations that we did.

INTERVIEWER: Ninety eight percent of keeping the boat afloat, type of thing.

GLEN: Yes. The float and move, fight – this would be the float and move. Yes.

INTERVIEWER: Yes. OK. So, at some stage there, you were commissioned?

GLEN: Yes. Not necessarily commissioning. It was a naming ceremony. The first two submarines—VICTORIA and WINDSOR—had formal naming ceremonies in Barrow. CORNERBROOK intended that, but due to the delays inherent in the program, ended up having just a simple naming ceremony at Faslane. We mirrored that on CHICOUTIMI. We went into Faslane for a naming ceremony—very brief—about two hours or so—and a little reception afterwards. Then, we sailed on the 4th of October, 2005.

INTERVIEWER: And that was sailed for Canada?

GLEN: Back home for Canada—yes.

INTERVIEWER: OK. What was your personal confidence a) in the boat, and then, b) in the crew, at that stage?

GLEN: Both high. I say that unreservedly, and not trying to put a spin on it in any way, shape or form. As I said, I consider myself fortunate in being very experienced with VICTORIAs. I can compare the three submarines, and we were the best of the three that I personally have been on—not by much. Not to say the other ones weren't, but just by virtue of we had the most experience. We had the newest boat that had—the oldest boat, but it had the most work done to it and with a lot less defects than the other ones have.

INTERVIEWER: That was my question. You always sailed with some defects, but—or my experience. Was that a long list of defects you sailed with?

GLEN: On WINDSOR and CORNERBROOK, the defects were a lot more than average. My personal opinion is it was due to the reactivation. It's not a refit. It's a reactivation. It wasn't in the British interests to do a full meal refit, because they weren't being paid to do a full meal refit. They were being paid to do a reactivation. Having said that, all the systems met the basic safety standard, but there were a lot more defects than there should have been, by the nature of the systems that we were doing.

CHICOUTIMI was different. As the guy that coordinates all the defects for the Combat Systems department, I can state categorically that the ones on CHICOUTIMI—my list on CHICOUTIMI was a lot smaller than my list on the other submarines. So, she had the best of the work done.

INTERVIEWER: From what you knew of the Chief ERA, what…?

GLEN: Same thing as well, on the Chief ERA side – an experienced guy—David Notesworthy—been a submariner longer than I have. They had also a lot less defects. That's not to say they didn't have significant defects and they didn't have, in their own right, a large list, but that is bog standard. I mean, it's one of the most complicated mechanical machines on

earth, is the submarine. The pressures it goes under—everything has to be—there's so many layers of complexity to these systems that defects are inevitable.

INTERVIEWER: When you mention layers of complexity—and I digress a bit here—how would you compare the layers of complexity on the VICTORIAs, compared to the O-boats?

GLEN: Let me give you an example. In terms of propulsion, on an O-boat you had, I think, two, three different ways to control the propellers if you lost your main propulsion. On here, method number three is the OBERON way. OK? And then, there are layers below that. There's like four or five different backup systems and redundancies built in. For example, electrical—volt A/C electrical, on the submarine, is controlled from two A/C generators—one at each end. They have their own separate switching networks.

A/C equipment throughout the submarine is fed from two sources—a normal supply and the alternate supply. So, one from the forward MG; one from the after MG. So, if you lose one, you've got the other. So, it's still—like those layers of complexities. In other words, if you've lost the after MG for some reason, then you've got the forward one and you convert over the equipment from its normal supply to its emergency supply and things like that.

INTERVIEWER: Plans for getting back to Canada. Can you comment on how long the cruise was supposed to take, and how long it did?

GLEN: It was approximately two weeks or so. Its intent was the real—a lot of training. The intent was, as I understand it, when we got back, it would be a very brief period alongside—a month or so—and then, it would be right out into hard course logging for training, to try and reduce that backlog of submariners, which we're still suffering from. So, that two week transit was designed to be high on the training. We had a lot of extra people on board—not a lot, but you know, six or seven, eight—somewhere around there.

INTERVIEWER: So, you were over sixty people?

GLEN: No. That was it—that was up to the fifty seven souls on board when we sailed. That's the fifty-two crew and the – there's always those training people there. So, we'll say fifty-six—fifty-six, fifty-seven—they'll always be there. So, we sailed with fifty-seven people on board.

INTERVIEWER: Well, I guess, take me through the cruise. When did you leave and what was it like?

GLEN: We left on the 4th of October. The fire happened on the 5th of October.

INTERVIEWER: What were the weather conditions like?

GLEN: The weather conditions were pretty choppy. We were initially—submariners hate being on the surface, except for the jammy watches you get. For the most part, anything more than, you know, a ripple, you want to be under water where there's no motion. So, we were hoping to dive early. We were initially scheduled to dive early, but as I understand it, there was a

scheduling conflict with another unit in our water. So, we were asked to extend our—to sail out further to a new diving position.

The weather was pretty choppy. I had the watch on the plot the night before. I think I had the midnight to two o'clock watch on the morning of the 5th, on the plot. It was pretty choppy, but it was a pretty quiet watch. I remember turning over to my relief, Petty Officer Pat Drown and saying, "Pat, the world's quietest watch. Nothing went on—just perfect." Then, I went to my bunk. He had the first little mini flood down the conning tower, so a bit of wiping up water there.

INTERVIEWER: Sea conditions?

GLEN: Sea conditions, at that time, were pretty choppy, but not a storm by any stretch of the imagination.

INTERVIEWER: Up to five feet or ten feet or twenty feet?

GLEN: I can't tell you how it translated into wave heights or anything because, of course, I was on board the boat. But it wasn't heavy rolling and bracing yourself and parallel ruler flying across and smashing. It was more just…

INTERVIEWER: It was not like what you experienced in OJIBWA?

GLEN: No, absolutely not. And not like we experienced on CORNERBROOK. CORNERBOOK was—you know, you're sitting there on watch and you're sick—in my case, sick as a dog. You know, you're constantly bracing yourself and chasing dividers across the deck and books falling around. It's just endless. It never stops. This was nothing like that. This was normal sitting here at the table as we are now – slight little bit of motion, occasional little rock and throw you to one side, but nothing major.

INTERVIEWER: OK. So, you actually came off watch—the watch—before the accident?

GLEN: No, that was the night before. That was at two in the morning. The accident didn't happen until about 12:00 or 13:00 the next day – later that day. But there was actually a little ingress of water down the tower earlier that day. That was, again, on Pat's watch, when we were taking a greenie down.

INTERVIEWER: Now, conning tower, in the old American terms, was actually a fighting position where there were five or six men…

GLEN: Right.

INTERVIEWER: …in the submarine. Now, are the VICTORIAs like that, or are they like the O-boats?

GLEN: They're like the O-boats. When I say conning tower, I mean the actual tower inside the

fin. The fin, of course, is the big projection that sticks up from the casing that houses the masts and periscopes and stuff. This conning tower itself consists of an upper and a lower hatch. That's just one small section of the forward. It allows for people penetrating through the pressure hold, down into the body of the submarine.

INTERVIEWER: So, the conning tower itself is nothing more than a passageway.

GLEN: No. On VICTORIAs, unlike OBERONS, that conning tower also doubles as a SPS chamber, for letting divers out. But we haven't done any—that's operational and we haven't done any operational with that. Personally, I don't see how you're going to fit five Canadian sized mill-drinking divers into a little tiny conning tower, but there you go…

INTERVIEWER: But in normal activities, it has no functional dive deck—no functional purpose?

GLEN: No. There is no—like American boats—another deck up there, where they can—no.

INTERVIEWER: OK. In the O-boats, did you get water down the stack?

GLEN: All the time. This is a—it was annoying to us in that to see in the press with all the big deal they had about this coming down. Water; submarine; ocean—they go hand in hand. Granted, the degree of—well, the quantity of water—it was a bit unusual, but again, not unexpected when a wave is higher than the – comes up higher than the conning tower. In all cases, especially on these VICTORIAs, because there's a conning and everything there, the water is contained in that area. There's drainage systems there for draining it down into the tank.

INTERVIEWER: You mean in that area of the conning?

GLEN: The very lower conning tower, where it comes down onto the deck. Yes. It's contained in there. I wasn't up on one deck, so I can't tell you—did it come over the level of the conning, with the boat rocking, or were there little gaps in the metal seams that—I have no clue. I was down below at the time. What I do know is I was in the Chiefs and Petty Officers' for the second flooding—the one that led to disaster.

I was in the Chiefs and POs' mess down below. We were just preparing for lunch. Just outside the door of the Chiefs and POs' mess is directly below the deck, underneath the conning tower. So, if you imagine the deck in the control room, directly underneath the conning tower, there's a circular hatch, that's normally just screwed down with dogs. It's not an access hatch. It's there if you have to – passing major equipment up for the mass wall, for removal of equipment. That started pouring water all around its circumference. It's about a twenty three inch diameter hatch or so. It started just pouring water down. So, that would have been the water that came directly down the conning tower, and sitting on the top of that little access plate there.

INTERVIEWER: So, sitting on the deck.

GLEN: Yes. This was the other side of that deck.

INTERVIEWER: OK. From the deck on the—from the upper level deck…

GLEN: Yes.

INTERVIEWER: …of the (?)

GLEN: So, it started pouring down. I yelled, "Water!" Guys were coming from every which corner. We spent a good half an hour to forty minutes, wiping it up. It was frustrating, because we'd get it all dried up, and then, the boat would roll and then, more would come sloshing out. So, we're starting again.

INTERVIEWER: Where was this water coming from, at this point?

GLEN: As the boat is rocking back and forth, it's sloshing. You try to contain it. We make little, you know, with pieces—you soak it up with rags, paper towels and stuff. You make little dams and everything. The boat rocks and some more comes out.

INTERVIEWER: Are you talking quarts or gallons or tens of gallons?

GLEN: I can't tell you. I'm poor at judging quantities and volumes, but it wasn't a typical greenie, in terms – a greenie is water coming down the conning tower. It wasn't a typical greenie in terms of—wipe up – five minutes later and you're wiped up. It was more significant than that. But it wasn't, you know, you're up to your ankles in water. It was just a small quantity.

INTERVIEWER: Now, this is asking for a supposition, but did it all come in at once, or was it…?

GLEN: Yes, I believe it did because, based on talking with the guys afterwards—the guys who were up in the conning tower—what happened was we had a defect, which we had in the past and had been repaired. There's a small vent valve on the upper lid—the conning tower upper hatch. That had a defect in it that must have been rectified before we—a submarine can't dive with a defect in the conning tower hatch. So, the two – team of two stokers were up there, stripping it apart—seeing if it was a spring or something we replaced. They had just reassembled it, when the water came down.

Their instinctive reaction was to scramble out of the way. One guy went down. Another one went up, and on the hatch to hold—to prevent the water from getting into the boat. So, it was just like a one only slug. It should be noted, too, that for an hour beforehand and for the entire three and a half hours afterwards, water was nowhere near that upper lid of the conning tower. OK. So, if you have that, like, four, four and a half hour window, water was nowhere near, except for that one time when it came up and down over.

INTERVIEWER: So, a rogue whale—rogue waves, rather.

GLEN: Exactly. And that was, again, the frustrating thing from the crew's perspective, to see all the armchair experts in the world commenting on things that they really had no clue about. I can understand why they do it. It's human nature. But at the same time, the press went on and on about the water coming down. You never see—excuse me—four and a half hours, water nowhere near. Far – many, many feet below that level, you wouldn't expect—yes, it's a possibility the water could suddenly come up, you know, ten [or] fifteen feet in the air, but is it likely? No—not really.

INTERVIEWER: Well, I guess we're at the stage where you can start telling me what happened, then? At that stage, you had water coming down on to the lower deck.

GLEN: Yes, we had just wiped up down below. We were just getting—eyeing—my belly was grumbling, and I was thinking of the lunch that we had not had because we were wiping up water, when the engineer, who was at the aft end of the passageway, on two deck—I was at the forward end—the engineer turned to me, because my position in emergency is in the Chiefs and POs' mess, which becomes damage control headquarters—DCHQ. So, in DCHQ, I'm—first, I will brief on the DCHQ organization.

There's the engineering officer, who is the DCO—damage control officer. There's two officers that rotate between that position. There's three cells. There's mechanical cell, electrical cell and weapon cell. I'm weapon cell. Essentially, we have all the publications – about eight different books that detail the entire structure of the submarine—every fuse, every valve on it, and all the circuit diagrams. It's our job—DCHQ's job—to coordinate the isolation and the solving and the repair of any problems that come up.

So, the engineer turned to me. I asked why he was turning to me, because he knows I'm DCHQ. He said, "We've got a problem. There's a full VP earth." What that means is VP—variable power—it's the submarine's main power coming out of the battery – 800 volts – anywhere up to 8,000 amps—very, very heavy current. A VP earth is very serious. It is catastrophic.

INTERVIEWER: How did he know about that?

GLEN: He had received a report from one of the electricians, saying, "Sir, we've got a VP earth." That was from the motor room, where they connect – we can instantly tell – we've got an air filter system. So, he said, "Close up DCHQ." So, every one of the guys that were just starting to go in there for lunch. "Sorry. You guys are out of here." At the same time, general alarm, "Full VP earth. Full VP earth. DCHQ – close up." So, we closed up.

Essentially, what we did over the next few minutes is attempt to isolate where on the system, stretching throughout the submarine, that earth was. So, if we can isolate it, we can get that leg shut down and then, we can bring up the rest of the system and try to restore things back to normal. So, the standard procedure for that, essentially, is to transfer all the load from one battery onto the other battery. By that I mean that each battery, through the various power networks, will feed equipment.

So, that equipment, being fed from two sources – we shut off one source. We transfer it all on to the other battery. Do we still have the earth? Yes. So, we reversed it. We took everything that had been on that battery back to the original battery. Did we still have the earth? Yes. I remember the Chief Electrician saying, "That's the worst possible situation, because now we can't isolate without further work."

So, we were just restoring it back to the normal lineup when we heard—it sounded far in the distance, and now we realized it was directly above our heads, in the Captain's cabin—upper hatch and slightly to port, in the Captain's cabin. It sounded like—the sound will be with me for the rest of my life. It was a banging—like a "Bang! Bang, bang! Bang, bang! Bang!" – rapid banging, like popcorn going off. It was very wrong. There's many sounds on a submarine, and this clearly isn't one of them. So, we knew something was wrong.

At the same time, in the back, in the motor room, their gauges were just swinging wildly from one side to the other. At the same time, in the control room, that was the first of the electrical explosions coming from the Captain's cabin—very, very rapidly—generating smoke. So, three things happened simultaneously. In DCHQ, we were all turning to the DCO, and saying, "Cut the power. Cut the power." As he was reaching for his microphone, to tell the motor room to cut the power, as the motor room were cutting the power, because they're not – you know, they're not dense. They know what's going on. So, all these were happening simultaneously.

Suddenly, the submarine went completely dark, obviously, with—they've just isolated all power throughout the submarine.

INTERVIEWER: So, when that happened, you disconnected the batteries from everything?

GLEN: Yes, we just opened up the main and auxiliary power breakers.

INTERVIEWER: Right.

GLEN: One of the two had broken open—I can't remember which one. But at the end of the day, main and auxiliary power breakers are open—both black. All power has been isolated on the submarine. All the MGs—they all shut down, because they are fed off those batteries. Electrical Cell – Chief Petty Officer Jim Hewitt—he knew that – first off, smoke is journeying rapidly throughout the submarine. But he knew a switch in the passageway had to be made to turn on secondary lighting. OK? So, he left.

As it turns out – just before I get to what he did. They were having – those bangs up top – they were—we didn't realize at the time, but there was a fire starting and the smoke rapidly filling the control room. There was someone piped, "Fire. Fire. Fire. Find the Captain's cabin." Then, from outside the Chiefs and POs' mess, which for me was about ten feet away, there was a loud bang—just this devastatingly loud bang. Even in the blackness of the submarine, there was a big orange glow coming in from the door. We could feel the heat.

There was—it's like a close-up look of a cloud when you're in a plane, but it was black—not the white you expect. It was just rolling and very curvy and it was just pouring in, in little tendrils of

smoke coming in. It was through that—that fire was like ten feet away—it started another fire. So, we had two fires—the same source, but two fires on two different decks, one on top of the other. Jim left the Chiefs and POs' mess. His intent was to feel his way down the passageway, about fifteen feet, twenty feet, to the secondary lighting switch, turning it on and making his way back. He left, headed aft, turned it on. It made zero difference, because the smoke was so dense, you just couldn't see. He turned to come….

INTERVIEWER: The lights did come on?

GLEN: The lights did come on, but effect was zero. Jim turned to go forward, back into DCHQ, which is his position, and he couldn't get forward. There was a wall of fire there, by 35 bulkhead. On top of this, people are scrambling to get breathing masks. From my own perspective…

INTERVIEWER: OK. Breathing masks?

GLEN: OK. EBS—emergency breathing system. It's a network that runs throughout the submarine. There's—I don't know the number—eighty, ninety-six—something like that—plug in connectors, throughout the boat. In various locations, you have little pockets of masks in a locker. So, anytime—well, all through our training—this was a real pain—these masks. You know, any time the general alarm goes off, you've got to get your mask out, even if it's for a flood. So, I know we're rolling our eyes. "Man, these British, making us do this stuff. To grab a mask in a flood—that's going to help me." But the wisdom of all that really became apparent.

So, guys were all scrambling to get a mask. From my own perspective, the Chiefs and POs' mess – the heat coming in from the door, the smoke coming in and pitch blackness. I thought I was going to die. For a period of about two or three seconds, I thought I was going to die. It's very strange, because I've never felt that way before. There was a brief moment of regret—a brief flash of regret. Then, it was gone. It was the calm. Again, very strange.

Just as I was reaching the acceptance point and beginning to cough heavily, because of the smoke in my lungs, I remember a mask being thrust into my hands. Francis Couture—Petty Officer Francis Couture, of the mechanical cell kind – DCHQ—I remember hearing his voice, saying, "Stu, it's plugged in. It's charged. You've got air."

So, I turned to give the mask to Lieutenant Commander Doug Rankin, my boss and my friend, who was sitting beside me. He's the other DCO, but he wasn't the DCO this time. He was the alternate. [I] turned to give it to him. We were so close together. I mean, submarines are so tight. We're all cramped in like little sardines. But despite that, I didn't realize that he wasn't there. When I turned, and the back of my hand hit the locker, and I said, "Doug, here's a mask for you." There's no answer. So, I started feeling.

In my mind's eye, I thought he must have slipped down onto the deck. So, instinct overcame teamwork. Coughing heavily by this point, I put the mask on my face. Like the idiot I am, I forgot to press the "purge" button and blow the mask clear. So, my first breath beyond that was not a good one. So, for a minute or so, I'm coughing into the mask, but had the presence of mind

to stand up. Getting on my hands and knees—I had just bought a little flashlight—a little red flashlight—mag light sort of thing—in Faslane. I pulled it out, turned it on, and I could see like half an inch in front. It was just—it was completely and totally useless.

So, on my hands and knees, I'm sweeping my hands out in front of me, yelling, "Doug. CSE. Doug, are you there?" and feeling—getting out of the door of the Chiefs and POs' mess to the fire—a little too close to the fire, until I was as far as I could go. My head was craned back, because of the tether of the line. Sweeping out—and he just wasn't within—and it's funny. It's like a switch going off in your mind what, to that point, was driving—I must find him, because I'm the only one that's realized he's fallen unconscious or something—to out of my mind. I mean, I can't do it—there's nothing I can do any more.

So, I came in, sat back down. Francis had got four masks out. He had plugged one in and given it to me. He had plugged one in and given it to Master Seaman Derrick Godin, the plotter. He didn't have time to plug in the Engineer's, but he gave it to him and said, "Sir, here's your mask. It is not plugged in." He reached for his own, and in the pitch black, he couldn't find it. By this time, he was overcome, so he was gone. So, we lost our electrical cell, Jim Hewitt, had gone out to the switch and he couldn't get back. We had lost our mechanical cell, because he had to leave to get breathing.

Afterwards, as we realized three or four hours later, when the lights came back on and when we could see, the mess we were in was black—just solid black. So, all of us were black. We'd been breathing that mask over three, three and a half hours—and took it off. Guys would, "Holy, Jeez," when they saw us standing there, you know, with all these black faces covered.

But what was chilling and I don't know if you've seen that CTV episode, the Fire Within, on W-Five, but that engineer, Doug Young, he's talking. At one point, he chokes up, when he talks about the marks in the soot. What he's talking about is up above his head, you can see finger marks all around the plug-in connector for his air, where he was scrambling to find that little connector that would save his life, and he did. But when you look up and you see those finger marks and realize what they represented – a little lump in your heart.

So, we all got our masks. For three hours, essentially, we were wondering how many of our shipmates are dead and how many managed to get a mask on and survive. Throughout the boat, the actions were just astonishing, as we learned later. As I said, Jim Hewitt going through the flames to get to the secondary lighting switch; Mark Miller—Master Seaman Mark Miller—and Leading Seaman Gary Taylor out in the passageway. Not only did Mark get all the fire fighting gear together and advance up and put out the fire—the lower fire, in the electrical space—but as guys were passing him the flats, he would grab them, throw them into the Junior Ranks' mess, where Gary Taylor would slap a mask on them and sit them down in the corner.

INTERVIEWER: Interview with Stuart Glen. End of Tape 1, Side 2.

END OF TAPE 1, SIDE 2

INTERVIEWER: Canadian War Museum Oral History Program interview with Stuart Glen, recorded on 26 January 2006 at Ottawa, Ontario. Interviewed by Peter Mace. Tape 2, Side 1.

Stuart, we're into the incident now. You were telling me about the actions of some of the people. So, could you pick it up from there, please?

GLEN: Yes, as I said, Gary Taylor and Mark Miller—not only putting out the fire, but rescuing other guys. Lieutenant Steve Darrigen, who was on his—literally, on his hands and knees, feeling his way down the passageway, just on his last breath and his last—before passing unconscious—bumped into a pair of legs that turned out to be Gary Taylor, who reached down—who is the leading seaman in his department. I mean, he's the engineering officer and Gary's our baby engineer and Gary's a stoker—reached down, felt it and touched bare face, and put a mask on and nursed him off in the corner.

INTERVIEWER: When you said putting out the fire, what would they have fought the fire with?

GLEN: Extinguishers – AFFF extinguishers. In fact, I remember being in the Chiefs and POs' mess, and our concern was getting—making sure all power was off, because you're going into electrical space, which is where the name of that space is—the fire on Two Deck was. With a water extinguisher, obviously, you don't want the power to be on.

I remember Mark's voice coming in to us, "Is the power off? Is the power off?" "Yes," we confirmed, "All power is off in the electrical space. You're free to advance." Then, him yelling back, "I can see a light. I can see a green light in the electrical space. Confirm the power is off." And we were all puzzled. Green light—what was going on? Then, one of us realized, "OK. That's the twenty-four volt battery." We said, "That's fine, Mark. It's just the twenty-four volt battery backup for the Armour-Brown emergency compass that's in there."

So, Mark went in and sprayed and the fire was out. Upper control room, as we later heard other tales. Master Seaman Wayne Buzzard, who was the guy that primarily put the fire out—he – we have a device in the engine room called the SFU-90. It's a big A trip[?] left container – 90 litres. It's a hose. In the event of a fire, you—someone grabs this and runs it for—runs it to the location. So, we all know to stand clear if the SFU-90 is coming through. That's one of the first things we get there. That arrived up on scene in seconds.

Buzz, who had been on the ship control console—the main console that controls everything on the submarine—that panel was completely dead, of course, because there was no power—he stood up, took the SFU-90. I don't believe he had a mask on at this point—and went right into the Captain's cabin and started to spray. But he had…

INTERVIEWER: And this was with water?

GLEN: Yes, it was a water/foam mix. To his astonishment, the nozzle fell off the SFU-90. The clamping arrangement that was holding the nozzle to the hose failed. So, Buzz had the presence

of mind to pull the hose more, step right inside, and just discharge foamy water onto the deck. Between that—putting out that fire—and flowing down below—and helping to put out the fire down below that Mark was attacking with the extinguisher—we got the fires out.

INTERVIEWER: How long did it take to get the fires out, you know, from the beginning?

GLEN: If I had the log with me, I'd be able to tell you. Just glancing at – my position at DCHQ was to record in the log—keep a log of events. That was only possible because once the upper—the conning tower upper hatch—was opened again, to a [indistinct word] that started to. After about twenty minutes, we noticed that we can just start to make out shape, and we realized that the smoke was thinning out. So, at that point – I think it was at minute, twenty-three [seconds], the engineer ordered me to keep a log of events. From that moment on, until we arrived back in Faslane, myself, and one other guy, maintained that log. I forget the question that led to that. Sorry.

INTERVIEWER: How long from the time of the bang, if you like, until the fire was out?

GLEN: Oh, right—until the fire was out. So, based on my recollections of that log, there were—it was actually about forty-five minutes before we actually confirmed the fire had been completely overhauled and the last smoldering remains were out. But the fire itself was out within no more than seven to ten minutes—that timeframe, in general. Again, if I had the log here, I'd be able to tell you exactly.

INTERVIEWER: And what was the condition of the boat at that stage?

GLEN: The condition of the boat. Well, all power was gone and all propulsion was gone. We're flopping on choppy seas—not too choppy. I don't recall being thrown around or anything—just the normal motion of the boat. All of us are on ABS, wondering – just total disbelief that this has happened. How could this happen? We're in control of our situation, wondering which one of our—in my case, wondering which one of my shipmates was dead. There must have been casualties. The brain just doesn't imagine something of that happening—guys lying in their bunks sleeping, and all this happening, and there not being someone that's seriously injured.

As it turns, there was no one that was dead. We all managed to get masks on, at one degree or the other. Isolated from each other—pockets on the boat, because the communication is gone. The twenty-four volt battery backup allowed us to have limited communications. Our main DC net—the damage control network—it's little nine volt batteries and it's designed to be—work, if everything else fails – didn't work. It was just static—completely useless.

Ironically, before we had sailed, we had bought little FRS radios—little – the type you get in Costco—little family radios. We wanted to see if that would work, because we always had a problem getting from one end of the submarine to the other using PRCs. We had bought those as an experiment, and we're lucky we did. They were a complete lifesaver for the next five days, because they worked beautifully. But we had the main communications left over, so there was communications between DCHQ.

At the time, it was still pitch black in DCHQ. We said, "We don't have control of the incident. We can't see our publications or books." The Captain and the motor room were talking back and forth. We were hearing—listening in to anything that came in, within my purview, got recorded down in the log. Essentially, it was a waiting time for the next three and a half hours, as it turned out. The main concern was: is the fire out? Yes, the fire is confirmed to be out. The fire has been overhauled. Old, smoldering ruins—the Captain's lockers and bunks pulled apart—everything soaked down, as best we could.

Another major concern—our fire fighting capability has been ninety percent exhausted. We've got very few fire fighting appliances left. Background concern—how long are we going to be able to breathe in the air? A lot of guys had that concern, but in DCHQ, we had no problem, because we knew, many, many hours of breathing. We had all sorts of other air networks we hadn't tapped into yet, should it be. But for most of the guys, or some of the guys on board, it was a valid concern.

INTERVIEWER: How much of the submarine was affected, though, by the smoke?

GLEN: Essentially, the submarine is divided into three chunks. 35 Bulkhead and everything forward, which is….

INTERVIEWER: That is the forward computer room?

GLEN: That's the forward computer room on one deck, and on Two Deck, it's all the accommodation—all the sleeping spaces, and the heads—the two heads. Between 36 and 56 bulkhead, on one deck is the control room, and the radar area, towards the back. On Two Deck, it is the three messes: the wardroom, Chief and POs' and Junior ranks' mess. The galley after that, and then, the AMS—the auxiliary machinery space—where the four MGs, hydraulic pumps and all sorts of stuff. The gyro room is back there, as well. After 56, which is just one big open area, and that's where—it's divided into two sections. The forward of the two sections is the engine room, where the two engines are, and aft of that, behind the acoustic bulkhead, but not a watertight bulkhead, is the motor room. OK?

The area primarily affected was between 35 and 56—was just solid black with smoke. They had gotten a smoke curtain down and backed it up with sleeping bags, at 35 and 56, which prevented smoke from—the idea is to contain the smoke. It was also—it was mostly successful. They were all breathing, throughout the submarine, on EBS, of course.

So, in that circumstance, the other major concern was our ability to float, because we have now lost our ability to run, like, the LP blower, to keep the submarine afloat. So, over time, that became more of a concern, as we started wallowing, because as the boat motions a little bit of air is lost; a little bit of air is lost. Over the course of twenty-four hours, you wouldn't sink, but you would, you know, obviously get heavier, right? So, it was trying to—many schemes to try to come up with ways to restore power, to get those up and running, to give us more of a comfort factor. The other big thing was a major thing was how are we going to clear the smoke?

INTERVIEWER: You mentioned the LP blower. Maybe for those not familiar, what's the function of that?

GLEN: OK. An LP blower—low pressure blower—it takes vast volumes of air and brings it to low pressure. It's an ungainly thing. It's loud and it sounds like it's about to explode into smithereens whenever you run it. It's just the way it sounds. But what it is, is it takes air and it puts it at very low pressure into the balance tanks, to blow out the water. For example, when we want to surface the submarine, we use high pressure air, stored in bottles, at two hundred and seventy six bar. That blows the water out of the tanks—ninety percent. We use—when we're on the surface again, we use the LP blower for fifteen minutes, to run to make sure the last of the little bits are out at low pressure. Also, once a day in harbour, we run the LP blower, or once a watch on the surface to make—just to clear the last of the water out of the balance tanks.

So, that's what we were concerned about—getting that back. But the main concern, as I said, we had, was getting the smoke out of the submarine. All our methods of doing that were completely useless. We had never trained for a situation where we had lost all power. That wasn't a gap in our training. It's just, as I said earlier, there's so many redundancies built in – everything fed from different sources. No one had envisioned the situation where both batteries—the power from both batteries—would not be available at one time. We managed to stumble into that.

So, it was how do we clear the smoke? We can't run the engines because they all require electronics and electricity to get them going. We can't run the fan—the extractor fans we have throughout the submarine. How are we going to get rid of the smoke? That was a—if we didn't find a way, more than likely would have had to abandon the submarine, because we just couldn't stay days in that environment.

Aubrey Rice—Petty Officer Aubrey Rice and his team—Francis Couture and other guys back there—Go Deetes[?]—absolutely brilliant. They invented a new way to run the engines, essentially. All the things that we had been taught—gone. The books were useless, because 1) we couldn't see them—it was full of smoke; and 2) as I said, it all relied on electricity.

So, they invented a new way to run the docs—docs being diesel engines. They took bits of—off bits of rubber—the ends of pencils off, and they put them in contact, so the contacts couldn't shut, and things like that. They put—we call them gags—they go over valves—hydraulic valves—to force them into a state. So, they overrode all—not all—but a lot of the safety interlocks in order to get one diesel, and it tried, and it wouldn't come up. It tried, and it wouldn't come up, and then, up it came—beautiful music—and got the starboard diesel running on no load—meaning, it's not charging any battery. It's just running. That was sucking air and that was beautiful when they got that going.

But, standard submarine practice, for example, completely reversed on its head. The induction haul valve and emergency flat valve—two big massive valves—bring air into the submarine. Never in my life I ever think I would hear a pipe like, "Control DCHQ. Cauter the induction haul valve open. Control DCHQ. Lash open the emergency flat valve, and have a knife standing by to cut." Because the concern was if we took water down the induction mast, it could trip the emergency flat valve shut, and the diesel would trip out and we'd never get it started again. We

absolutely couldn't afford that. So, standard submarine practice completely reversed. We latched these valves open, where normally they're ready to shut in an instant. So, that managed to clear the smoke.

INTERVIEWER: You mean the diesel sucked the air?

GLEN: Yes, it took an hour or so, but the diesels worked. The other thing is, how do we – normally, the smoke extraction is accomplished by fans altering the normal ventilation lineup, to extract from a certain location. But we had no extraction fans other than that, so creative ways had to be found in order to get the smoke clear from that centre section that we were in. Eventually, it was done. It got to a point where the draeger kit which we have for testing – the portable draeger for testing the atmosphere. We always….

INTERVIEWER: Can you spell draeger please?

GLEN: D-R-A-E-G-E-R. It's one of those things that when we're doing evolutions, as we call them—emergency exercises, when we practice all this stuff—we'll say, "Give us Draeger readings fore draft." And you know, in thirty seconds, "OK. Here's the numbers." Right? It's all a game, when we're doing it for practice. For real, it takes a half an hour to get your readings in, because the guys are really having to take the pumps, and really getting readings.

But we got one set of Draeger readings throughout the submarine. They looked good. Engineer ordered a second set, just to be on the safe side. They came in. The numbers tallied—they matched. One guinea pig take off his EBS—that was the engineer. He took it off, breathed the air – the air there –remove the EBS throughout the submarine. We all took it off—three and a half hours—streaky faces.

As it turns out, just a little bit of slight humour – while we were in DCHQ, before this emergency, trying to figure out where the electrical problems were, the cooks, very nicely – because everyone else was eating in the Junior Ranks' Mess – they very nicely passed in a tray of sandwiches for us to munch on, as we were doing this. I don't recall doing it, or I don't know if someone else did it, but at the time the emergency happened, that was just scrap, and scrap that right off. When I had stood up to look for Doug Rankin, inadvertently, I sat back in the tuna sandwiches and that was just gross [laughs]—black and squashed. But yes—so, that was that, essentially.

INTERVIEWER: Why do you think it happened?

GLEN: It happened—it physically happened because water got down the conning tower, and this happens – was an unforeseen series of events. When I was in basic training, we had a movie we watched. It was called *Seven Mistakes*. It was a US.—one of those US. training films we would get. It was seven little errors on a ship that, in that case, led to the sinking of the ship or something. Like, for example, watching a movie and the guy doesn't put a cap on the power plug when he takes it off. Later, when the compartment floods, water gets in and shorts the side. This was like that, in terms of seven—well, not seven, but little incidents that all led—that in and of themselves would be fine, that led to…

In my opinion, the Captain was full justified in that hatch—it's a working thing. It's not anything that is out of the ordinary way of conducting business. But a wave did come down and it did find a vulnerable area of our cabling system, that in my six years over in the UK, don't recall this had ever being a concern—a possibility that it could happen. Again, even our training—we never trained for what to do when you lose all the power.

INTERVIEWER: The other three boats were constructed the same way?

GLEN: Yes, they were constructed the same way. It's just—you would not think of it. If we were coming up with scenarios—if you were qualifying and I was coming up with scenarios to train you, I couldn't have come up with this in a million years.

INTERVIEWER: Just for the record, where was the failure?

GLEN: The failure was in the cabling underneath the Captain's bunk. In theory, it's designed to be completely immersed in water and have no consequence, despite the fact that it's carrying many thousands of amps through it. It's the main power conduit throughout the submarine. A combination of – I don't know the technical details of this, but a combination of the insulation breaking down as a result of the soaking, and the prolonged back and forth, as we were wiping up. That should never have broken down. Those cables are designed. They're sealed and coated in layers and layers of rubber and are designed, not that we ever expected to, but in the event that they are immersed in water.

It was that, that from reading the technical report afterwards, the insulation was breaking down inside, while it was still giving appearances. Then, suddenly, it flashed. Where it flashed, there was two great big holes through the inch thick steel deck. It just melted two holes. You could stand there in the Captain's cabin – just devastated Captain's cabin – and see down onto the deck below—these two holes.

INTERVIEWER: So, just in summary, what do you think the three or four factors were?

GLEN: Well, water coming down, getting into the cables, and starting a fire—two fires. And that was it—it was very simple terms. There's nothing beyond that that was a….

INTERVIEWER: I guess we got – that's the hard side. When we get into the soft side, how was being the impact on the crew that was on the boat—the fifty-six or fifty-seven guys that were on board?

GLEN: Well, we sailed with fifty-seven and we got back to Faslane with fifty-six. Lieutenant Chris Saunders, the man that was to be my boss—my new boss—Doug Rankin was leaving when we got to Halifax, and Chris Saunders was replacing him. I didn't know him. He had been in submarines for a while, but I had been over in England for many years, and never really got a chance to meet him. When we joined us at Faslane, the days before sailing, he looked like good people. He was going to be the number one influence in my life. I mean, I work with him day in

and day out, you know. It's sad that my recollections of him are confined to those couple of days. We never really got the chance to learn each other.

It was about ten or eleven o'clock at night, when the Captain made the announcement that Chris had died on the way to the hospital. The very definition of the word 'silence'. His guys struggled to absorb that. Up until then, as strange as it sounds, it was almost like a little bit of a boys' zone adventure. You know, we had gotten away with—not gotten away with anything, but you know, we had survived with something that should have killed us. There was—not cockiness, but you know, "Right on." This is just sobering.

INTERVIEWER: How were the other fifty-five members of the crew dealing with it?

GLEN: We're all dealing with it individually. Some well; some not so well. We've had guys on the crew that were—when the Swiss Air flight went down off Halifax, we had a lot of guys—some of the guys on the crew, that had been on ships—excuse me—had been on ships for that. You know, pulling childs' body parts out—so, they had traumatic experiences from there. This doesn't help—what came out of, as I understand, the stress. Some guys have mental issues to resolve. Some guys' actions were heroic; other guys, less so. It's all up to the individual. You never know how you're going to react at the time – which side you're going to be on. In many ways, you may react one way, one time, and another way, another.

So, guys were dealing with the physical effects. In my own case, it's breathing, as it is for a lot of other guys, and more so, the mental aspects of it. But the response from the Canadian Forces was really astonishing—not astonishing—wrong word—was very good to see.

INTERVIEWER: Had you served with Bruce MacLean—Admiral MacLean—before this?

GLEN: Not served with him. In 1981 or '82—'82—Cousin Brucey, as we called him, was one of the submarine COs, and I remember seeing him at a sports event, and he was riding a bike or something. But that's the only dealings I ever really had with him. I knew, obviously, who he was. He was just a generation before me. I had just got there as he was leaving submarines. But he was right there when we got alongside in Faslane.

INTERVIEWER: How important was that to everybody?

GLEN: Well, to tell you the truth, the fact that he was there wasn't so important. I mean, we were expecting the dog and pony show when we got alongside. It was good to see all the friends and all the Canadian response, but what was just really great was the HMCS ST JOHN'S that came. She had been off Newfoundland, heading back to Canada—just left St. John's, when this happened. The crew, thinking they were going back to Halifax, suddenly did a 180 and at high speed across the Atlantic. In fact, they got across in like, three days, they were there.

They pulled up alongside us, and it was just—it was a lovely sight. I remember one time, not with ST JOHN'S there, but with other ships, I went out to the bridge to go on a satellite phone, to call my family, and I was in tears. There was a ring of warships around—HMS MONTROSE and the WAVE NIGHT and other ships. It was just—it was a beautiful sight to see all the ships

there. I went back down below and I figured the boys were going to be laughing at me, for you know, tears in my eyes. One of them said, "Aw, don't worry about it, Stu." He said, "I cried when Casper the phantom—when Casper turned into a real boy, right?" So, but yes, it was nice to see ST. JOHN'S. She came over.

The other thing was they supplied us with a—we didn't realize it was Thanksgiving. I remember when I talked to my family—my aunt—she said, "Oh, Stuart. This is a—your phone call is the best Thanksgiving present you could have given us." I said, "Thanksgiving?" So, I went down below and I said, "Boys, it's Thanksgiving." None of us, at least in the area we were in, realized it. ST. JOHN'S, when she got there, sent down a hot Canadian Thanksgiving—turkey dinners. That was just delicious—unbelievably delicious.

INTERVIEWER: We kind of ended the story at where you got the diesels going. Was there anything of interest that happened after that stage?

GLEN: Well, it didn't end with the diesels, of course. It didn't end until we got back to Faslane, which was still days away. There was the lonely night, when we were out there alone, waiting for the first ships to come over the horizon. Many touching examples come to mind. An Irish fishing vessel took up station a half mile behind us, there to pick up anyone if we had to abandon the submarine, which was gratefully appreciated by the crew. An aircraft flew over—a Canadian aircraft flew over, on the way to Canada—apparently got in contact with Lieutenant Sebastien, to leap up on the bridge, the Bridge Officer—saying the people of Canada were following us and sent their prayers and asked if we had any messages for family back home, which was very nice.

At one point, the crew—twenty-one people in the crew—were sent off to one of the ships for a shower. There were the guys that had been injured but had, you know, were improving—not the critical ones that were sent off. To an individual—not one of them wanted to leave the submarine. Doug Rankin was one of the guys going and he said to the XO, "Sir, can we talk about it?" "Absolutely not. Get your kit. You're going." And the finality in his voice was—I remember to this day. But none of them wanted to go, and we felt awkward that they were leaving. But it was excellent because they brought them back before we got to Faslane, when we were still in the Cumbery[?] Gap. They brought them back by tug.

INTERVIEWER: How many guys were injured?

GLEN: There were nine people that were causalities—varying degrees—three of them critical, and of course, one fatality.

INTERVIEWER: And you're one of the nine?

GLEN: No. No.

INTERVIEWER: OK. But you said you had smoke inhalation?

GLEN: Yes, but fully functional at the time. It didn't really start affecting me until about a month after we got back alongside.

INTERVIEWER: How are you doing now?

GLEN: Good. I'm still in the medical hamster wheel. I'm—the prognosis is good for long term that I'll be able to get—but I get winded very easily. So, hopefully that will correct as we go along. I would say, in the crew, aside from the guys that were evacuated off, I would probably be the worst breathing wise, out of just circumstance though. But mentally, I think I'm fine. But a lot of guys are—not a lot – some—are just coping with it, every day.

Like, I work at the Louis St. Riel building now, and occasionally, we have fire drills there. I work on the sixth floor. So, we're going—spiraling down, to get to the outside, when it goes off – everyone laughing and chattering, you know, like we were before the fire. But I don't see it that way now. As I tried to explain it to someone, you see people walking down all laughing, and I see black smoke and hear bangs. I see what could happen—not what is happening. I think that's going to be with me for the rest of my life, and all the rest of us—we will always see what could happen—was just a.... So, as long as you're aware of that and mentally throttle back. I mean, don't, you know, [say] "Hey! Stop laughing! This could be serious." You know, that just would be too much.

INTERVIEWER: Out of fifty-six—it's been fifteen months, now, I guess?

GLEN: Yes, somewhere in there. Yes.

INTERVIEWER: And out of fifty-six guys, a number would have rotated out of submarines, shall we say, in the natural course of events.

GLEN: Yes. Myself—I'm retired now.

INTERVIEWER: You would have retired naturally, anyway.

GLEN: Yes, it was—ironically, I wasn't even supposed to sail. I was first approached about this job in DMS about a year before this happened. You know, "Come on, it's taking forever." And finally, I ended up sailing, and of course….

INTERVIEWER: You were there.

GLEN: Yes.

INTERVIEWER: But of the fifty-six—so, some would have rotated out, but how many guys have found it impossible to continue?

GLEN: There is about four or five, that I know of, that can't—most, for medical reasons. A couple more beyond that, that won't—entirely understandable. A couple that say they won't, but I think they will.

INTERVIEWER: So, the majority have…

GLEN: The majority of them will say, "No problem." The majority will go back.

INTERVIEWER: Yes.

GLEN: And if it hadn't been for the fact that I got onto this job, then, I would have stayed there, just because – I'm really lucky. I've talked to people and some guys like their jobs; some guys don't like their jobs. When I first saw a submarine, when I was seventeen – Gate Vessel weekend – came out to Halifax from Reserve. When I saw that submarine, OKANAGAN, up on the lift and the free flood holes and the blackness of it – it was just magic. And I'm so lucky, because that magic never left me, you know. Right now, even now, a submarine—if I would see a submarine in the harbour, I'd stop what I was doing and have to watch.

And a lot of guys—those of us that have been there for a long time, all feel the same way – same degree. So, we would be there, I think. But guys that are newer, guys with families, you know—for whatever personal reason—and no one ever feels any negativity towards—if a guy doesn't want to go, "Thanks for sailing. We appreciate it."

INTERVIEWER: Do you see a difference in the submarine service now, than in 1980, when you first went out?

GLEN: Yes. Yes. Maybe some of the old guys won't appreciate me saying this, but we're a lot more professional. I mean, I remember stories back before I joined and things I witnessed—you know, we're—not all the time, but occasionally—drunk at sea, on the surface, and stuff like that. None of that ever happens now. I mean, it's very rarely for guys even to take a drink on board. Maybe if we come alongside, yes, but not at sea. It's just absolutely not done.

The level of training, as well, too – and I know for a fact, had this happened on an OBERON, we would have lost the submarine. There's no doubt. It's just because the fire fighting arrangements are better on here. We're trained. We've got breathing all throughout. If anything happens, we just plug right in and go. I think back to the training we did back on OBERON—it was good, but we weren't at a level that we were on VICTORIAs, just from having done it so often, and right. So, yes, I think we're better off as a submarine service, in that regard.

INTERVIEWER: Well, is there anything that I haven't covered?

GLEN: Nothing comes to mind. Unless you have anything you can think of.

INTERVIEWER: I think I've run my list dry. Well, I'd like to thank you, Stuart, for your time this afternoon. It's been excellent.

Interview with Stuart Glen on 26th of January 2006. Interview ends.

TRANSCRIPT ENDS