

**Robert “Red” Larsen** wrote that this is a continuation from Part 7C, regarding various subjects and some background.

#### ***COMPRESSORS Standard Dress Hand Pumps***

This type of pump had been in existence for many years before my time, but there are some interesting points to recall. We had one on the Destroyer HMCS ATHABASKAN in 1952/53, and it was used to supply our on board Divers, “Speed” Ricard and an AB Stoker, who used only the Standard Dress rig(it was a Siebe Gorman assembly, if I remember right). But there were a couple of Aqua Lung regulators also on board. A little aside:- Speed, in his wisdom, decided to investigate how the Aqua Lung functioned mechanically, although he never said so. Anyhow, when we were in Hong Kong, our Executive Officer, Harry Shorten is sitting relaxing on one of the beaches, reading a book I heard. Suddenly his attention was directed to a swimmer in distress, so Harry immediately responded by plunging in the water for the rescue. Lo and behold, guess who the victim is? Yup, it was Speed trying out an Aqua Lung set, with not much success! Needless to say, these regulators were never discussed with us during the rest of the trip. Back to the hand pump. It was the first involvement Jim Balmorth and I had with diving, as we were involved in turning this big mother to produce air. Wow, I can imagine how the boys of old were in good shape turning these pumps. As I recall, it took six guys to turn the pump. Also, one of the requirements was to confirm that the pumps efficiency/output was up to scratch. There was a procedure that involved turning the pump, then using a mathematical formula to confirm the pump was capable of delivering a sufficient supply of air. These pumps weighed a ton to move around

On the West Coast, Diving Tender 2 originally had an air compressor of some type in the engine room, but I have no idea what manufacture it was. I do remember diving to 180 feet in Standard Dress, but if you bent over, you could hear the air supply diminish right away. Obviously we were not conforming to 50 psi over bottom pressure procedures. However, while Bayfield Davis was down one day in the harbour, this compressor blew up. We then resorted to what was termed a heavy duty portable (1800 lbs) air compressor which by using the boom, sat on the upper deck hatch. This was a US Navy version, with a limited output of 55 cubic feet per minute at 100 psi pressure. Not the best, but we used it for years.

#### ***YMT 9 and YMT 10 Boats***

I’m trying to remember if these came with a built-in compressor or not – can’t recall.

#### ***Worthington Compressors***

In 1957 or thereabouts, two large Worthington’s were installed at the West Coast Diving Unit to supply air for our hyperbaric chamber. This was a shore based unit, and I believe the East Coast Unit also had a similar set up.

#### ***Cornelius Compressors***

These were at first very small capacity high pressure compressors that we used for pumping up our CABA cylinders. They were very portable, weighing probably 30 to 40 lbs and very useful on away jobs, when required to fly by aircraft, normally for RCMP requests, etc. Later on, larger units came into production, but again they were pretty portable. They were excellent for those Arctic tasks.

#### ***Oxygen Booster Hand Pumps***

We all remember these gems! Pumping CDBA cylinders up to 3000 psi from Oxygen supply cylinders down at a couple of hundred pounds psi. Oh for those lovely training days! I don’t know what they use now-a-days, but the only powered Oxygen booster pump I ever became involved in, was at DCIEM during the 1980’s. I’m sure there must be something more appropriate these days. More up-to-date subject compressor equipment details will have to come from the younger generation.

## **RECOMPRESSION CHAMBERS**

### ***Diving Tender 2***

The chamber on Diving Tender 2 was a single compartment unit, ie: it had no second compartment, where you could lock-in or lock-out a person, but it did have a very small medical lock. Also, the construction didn't look all that robust, it looked like a very basic boiler type construction, and I have no idea what pressure rating it had. The control valve for pressurizing and de-pressurizing the unit was a very strange looking arrangement. Normally, it seemed only George Ackerman operated the unit with any confidence installing efficiency. One somewhat amusing highlight I remember, was when a Diver trainee named Don Britt (on Joe Lodge's course) was suffering from an embolism we thought, and needed to be re-compressed and treated. Pay per minute underwater had just come into effect at that time. Two Officers (who will remain nameless) were arguing who was going to be the treatment Tender, so they both jumped in the chamber and closed the door, ready to pressurize, but alas, they forgot the patient! Needless to say, there were smiles all around. This was the only chamber at the West Coast Unit until 1957/58, when we were issued a chamber manufactured by Siebe Gorman.

### ***Siebe Gorman Unit Chamber***

As pointed out above, this unit was installed ashore in 1957/58, and utilized the Worthington compressors previously identified. These compressors required a large source of fresh water for cooling, which was accomplished by using a large steel tank originally used as our display pool (about 30 ft long by 12 ft wide and 8 ft deep during our displays at the Pacific National Exhibition in Vancouver. However, after being used as a water source for the Worthingtons, it also was used as our pool to initiate our Ships Diver classes on their first dive. Very interesting in the winter to break the ice and say "OK, let's go". When you were the stand-by Diver, it was interesting to watch the trainee's eyes expand as you flooded out their face masks! Very enlightening! Back to the chamber, it consisted of a main chamber, an entry lock and a medical lock. Additionally, it had the capability to "marry" a portable one man chamber to the main chamber, thus allowing the transfer of a one man chamber patient into the main chamber, while both are under pressure. At one time, to keep ourselves conditioned to nitrogen narcosis, everyone did 250 foot dives once or twice a month. It was rather hilarious, as we generally played cards, especially Bridge, and sometimes the bidding got "narcked" a bit. One thing that did occur to start with was, at the 10 foot stop, cigarettes were passed in, and those who smoked puffed away. I don't remember when that situation was stopped. But on the East Coast in 1961, they passed in sandwiches, which we didn't mind at all! This chamber on the West Coast was replaced sometime in the 1980's or early 1990's, and they sent me a porthole cover, which remains with me to this day,

### ***YMT 10 Chamber***

When this vessel was first received, it had a so-called one man chamber in the after dressing room hold, but I don't recall it ever being used, or even flashed up, I just remember it sitting there. I'll tell you now, if I had ever needed to be put in there, they might as well have thrown in a bouquet of flowers with me, because I would need them when I got out – probably dead!!

### ***Portable One Man Recompression Chambers***

There were a couple of these on the West Coast. One was of aluminum construction, of which there is a picture of it in our website archives - Dan McLeod, Paul Passero, Dave Johnston and Bill Daley carrying it on trial.

Next, there was a green fiberglass one, which I don't recall its capabilities, but all of a sudden it was declared unsafe. I believe it was determined by engineering that the fiberglass stretched under pressure, but did not return to its original size when depressurized.. I did have an occasion to use this chamber, on a diving emergency evacuation of a girl from the BC interior to Vancouver General Hospital, but the patient did not survive.

### ***Draeger Portable One Man Chamber***

I don't recall when these chambers became available to us, but they were quite an improvement over their predecessors. It appears they are still in use today with, I am sure, modifications to their original set up.

### ***Sub Smash Chamber***

I can't recall when this capability arrived out West. This was, and still is, a somewhat portable chamber, but smaller than the shore installed facilities, which could be quickly loaded on a vessel of opportunity in the case of a submarine sinking, in order to provide decompression treatment for any submarine survivors who had escaped from the submarine using free ascent methods, and needed to be treated for decompression sickness. I am sure the present day Diving Units still have this capability.

### ***Diving Hoses and Umbilicals***

Over the years, many configurations have come and gone. Using the Mk V Standard Dress equipment, the air hoses were both heavy and awkward to handle. With the implementation of more modern surface supplied diving systems, a variety of hoses were tried. At DCIEM in the 1970's, evaluation of the air supplied to the Diver after passing through his air supply hose, did not meet the purity requirements of CSA standards. The main culprit being the presence of "toluene" in the air. It was discovered that toluene was used in the manufacture of most rubber type hoses. After considerable time and discussions, Gates Rubber Company, the maker of the most attractive hose for diving systems(at that time), agreed to produce a grade of acceptable hose without using toluene. A directive was then implemented, specifying that only Gates hose of this type was to be used for diving umbilicals. Since that time, many improvements have developed regarding umbilicals, which are not within my knowledge.

### **SUBMERSIBLES**

I do not know the exact facts of how we became involved in submersibles. I do know that on the East Coast they had a tasking that involved them working with a small submersible that had a Diver lock-out capability. The submersible was from Perry Oceanographics of Riviera, Florida, and that Ty Merritt was the sub pilot. The submersible was called "Shelf Diver". Barry Ridgewell and Ray Goullard were involved, and I believe this is when Barry realized the potential of a submersible. Hopefully, someone else can be more specific regarding this operation, possibly Bob Coren, also I heard that Bob Gwalchmai wrote an article about SDL-1. Unfortunately, Ray Goullard has passed on and Barry Ridgewell is in a Home suffering from dementia. Another possibility is LCdr James R. McFarlane, who was the project manager for SDL-1 at the time. He is now Dr. James R. McFarlane, President of International Submarine Engineering, located in Coquitlam BC – see their website.

### ***Submersible Diver Lock-Out – SDL-1***

My first involvement with this program was in April 1969/70, when I was seconded, along with P2 Andy Ouellette to be part of the acceptance crew for the SDL-1 project. Andy and I joined up with Lt. Barry Ridgewell, CPO2 Guy Fenn, CPO2 Willy Hilton, C1ERA Ron Dunbar and a wild Cape Breton P1 Electrician by the name of Macekeran at the Deep Underwater Test Range near Nanaimo, British Columbia. We were informed the deal was that the West Vancouver company, International Hydrodynamics were going to build a Diver lock-out submersible for us, but while they were building it, we would train and operate for the Company their present Pisces III submersible under the control and guidance of its primary pilot, and the Company Engineer, Mike MacDonald. At that time, the submersible was under contract with DND to recover Mk 48 (I believe) torpedoes that failed to surface after test runs across the 1500 ft deep test range. The Company also had contracts to display the subs capability to Engineers and Marine Scientists around Flower Pot Island, located inside Fathom Five National Marine Park, just off Tobermory, Ontario in Georgian Bay, and also the gas wells in Lake Erie, near Leamington, Ontario. After several weeks of classroom and actual dives in the Pisces III, we flew via Hercules aircraft to

Trenton, Ontario and carried on with these Company tasks, as outlined. We then returned to Vancouver to accept SD-1 and put it through its trials, etc. The pressure hull for SDL-1 was the sister hull of the submersible Beaver IV (also a Diver lock-out submersible) built, owned and operated by Rockwell International. The pressure hull resembled a large dumbbell in configuration, except one sphere (the Diver lock-out) was a smaller diameter than the pilot's command sphere. Rockwell International closed down their Ocean Systems Operations Division in 1970, thus this spare hull became available. On completion, we flew SDL-1 to the East Coast where we set up shop down at NAD (Naval Armament Depot) in Dartmouth NS. After about six months in Dartmouth, I submitted my resignation to the project as the result of a decision that only Officers would be submersible pilots – I will explain further when I write my own memoirs.

Unfortunately, SDL-1 (in my opinion) never got a real chance to prove its worth. First of all its Diver lock-out capability could never be used properly, since the mother vessel, HMCS CORMORANT never had a deck decompression capability. On top of that, it never had an acceptable mother ship (CORMORANT). What as originally envisioned, was an off-shore supply type vessel, complete with a deck decompression chamber, and also with a station holding capability, ie: twin variable pitch propulsion propellers. It was my understanding that the USN offered us such a vessel for next to nothing, but because of politics and government bureaucracy, it was a nonstarter – it had to be Canadian made! But after a 13 million dollar quote for the contract, we couldn't afford it. Then we got the Italian ASPA QUARTO (HMCS CORMORANT) for 6 to 7 million dollars!! Also, again my opinion, we always asked for more people and equipment before we do the job. My thoughts – do the job, then say we could do a **much better job** if we had this, etc. Anyhow, SDL-1 did do some interesting tasking, but someone else knowledgeable of those activities will have to expand on them. It should be noted, that one of its tasks was assisting in the recovery of the ship's bell from the ship SS EDMUND FITZGERALD, which sank in 530 ft of water in Lake Superior, near the entrance to Whitefish Bay, with the loss of all 29 crew on 10 November 1975.