



University of Victoria Submarine Racing Club (UVSRC)

2018 EUROPEAN INTERNATIONAL SUBMARINE RACES (EISR) RECAP REPORT

1/Jul/2018 → 14/Jul/2018

Gosport England

Author: Andres Agresot / Editor: Manuel Dussault Gomez

Attendees (10 members): Manuel Dussault Gomez (Dive Leader), Aiden Massey (Pilot), Russ Hiltz (Support Diver), Daniel Snyder (Support Diver), Jaryd Middleton (Pilot), Andres Agresot (Support Diver), Konnor Davidson, Tim Jun, Ryan Foxall, Ryland Henderson

Sunday 1/Jul/2018 (Day 0) - Traveling:

- The 10 UVSRC team members travelled from Vancouver BC on a straight WESTJET flight to London Gatwick airport in the UK. From there, members took a 1.5-hour train to Portsmouth, a 15-minute ferry to Gosport, and a 15-minute taxi to Kingfisher Caravan Park (accommodations during the competition). The 10 UVSRC team members shared one caravan designed for 6 people with one bathroom.

Tuesday 3/Jul/2018 (Day 3) - Registration:

- 12 teams qualified and attended the competition:
 - (4) Canadians:
 1. University of Victoria – **Chinook**
 2. UBC - **Skookumchuk 4**
 3. Ecole Polytechnique de Montréal - **Archimède VII**
 4. Ecole de Technologie Superieure Montreal - **OMER XI**
 - (1) Dutch:
 5. Delft University of Technology - **Wasub VIII**
 - (1) German:
 6. Rhine Waal University – **Rivershark**
 - (1) Polish
 7. Technical University of Gdansk - **Nautilus**
 - (5) Americans
 8. University of California San Diego – **Vaquita**
 9. University of Michigan – **Bluefin**
 10. University of Washington – **Knotty Dawg**
 11. Florida Atlantic University – **HPS Atlantic**
 12. Texas A&M University – **Hullabalooga**

- Teams met with event organizer, William Megill, to show paperwork, sort out diving equipment, and chat about rules and regulations of accessing the QinetiQ Basin. William also had a group of volunteers that helped him run the event, one of them helped with figuring out diving equipment needed before going to the Basin. Most of this day was spent travelling between the caravan park and the dive store to rent all of the diving equipment needed, which included two 7mm wetsuits, two regulators, and 50 kg of weight for all the divers and for ballasting of the submarine.

Wednesday 4/July/2018 (Day 4) – Unpacking/Assembling Submarine:

- QinetiQ basin, in Haslar Marine Park (Gosport, Hampshire, England)
Pool Dimensions:
 - 121 m in length
 - 61 m in breadth
 - 5.5 m in depth
 - Water temperature 13 C°
- The pool is primarily used for testing models of submarines and other vessels in scale to simulate water conditions at sea. For example, Babcock recently tested the deployment of a new buoy in this pool.
- The pool is able to recreate ocean conditions in order to improve the hydrodynamics and maneuverability of vessels. Waves up to 0.85m can be recreated in the basin. In addition, there is a spinning arm in the center of the pool which is used to measure drag, hydrodynamics, and diverse performances of models.
- In essence, Day 4 was devoted to unpacking/re-assembling the submarine in order to conduct dry inspections the following day. During this day, UVSRC team members familiarized themselves with the 4 mile walk from the caravan to the QinetiQ Basin. This walk was done every single day, whereas teams with bigger budgets rented cars for transportation.

Thursday 5/Jul/2018 (Day 5) - Familiarization Dive/Dry Inspection:

- Day 5 consisted of performing familiarization dives for all teams, and conducting the dry inspections. Team members had to present all systems to the Judges as they approached each submarine. The UVSRC was the **4th team to successfully complete the dry inspection** from the judges.
- During the time the judges performed the dry inspection of all UVSRC sub-systems, 6 team members (all of the diving squad), were performing a familiarization dive at the same time. This created a **discrepancy in the judging mark of the dry inspection**, since experienced members of the club (diving squad members) could not express the manufacturing process of various components of the submarine due to the fact that they were underwater during the dry inspection. If the judges would have waited for the dive squad to complete their familiarization dive, members of the club would have been able to answer very specific questions about the manufacturing procedures of various components of the submarine, thus allowing for a higher dry inspection mark.

- As previously stated, Chinook was the 4th team to successfully pass the **dry inspection with an overall score of 10.3 out of 12 points**. The dry inspection consisted of a full questioning of all systems in the submarine, explanation of design/manufacturing choices and mechanisms with strong emphasis on safety release system and pop-up buoy. After receiving feedback from judges, we made small adjustments to the submarine to make the safety system more reliable before moving forward with underwater testing. Although the judges asked about everything, their main concern was the safety release system and the "Dead man's switch".

Friday 6/Jul/2018 (Day 6) - Wet inspection:

- This was the first time the submarine went in the water, and it was only determined by successfully completing the dry inspection of the corresponding submarine. In essence, and just like the dry inspection, the judges' main concerns to allow the submarine to race is the adequate deployment of the pop-up buoy, the correct operation of the propulsion system, the diving squad's dynamics/organization underwater, and the teams understanding of all underwater procedures. The specific underwater procedures of interest to the judges included the starting procedure, and the emergency exit procedure.
- Without passing the wet inspection, **teams were NOT allowed to start racing**. The longer it takes to successfully pass the wet inspection, the less time you have to race, and thus the less points you will be able to make towards the overall reliability score of the eISR trophy. Some teams took so long to pass the wet inspection that they only started racing until Tuesday of the following week. The overall competition is a first-come first-served type of system, meaning that whoever is ready first, has priority in the pool.
- The UVic Submarine Racing Club **was the first team to successfully pass the wet inspection**, thus gaining reliability points towards the eISR trophy, and assuring the first spots to race on the following Monday morning.

Saturday 7/Jul/2018 (Day7) - Open House day:

- This day consisted on a Career fair day, where judges participated as key note speakers, and where teams presented their projects to the public, to industry personnel, sponsors, and mysterious guest judges.
- No team had their submarine at this event, since the submarines remained enclosed at the QinetiQ basin facilities. With this in mind, teams had to find an alternative way to present their projects. The UVic Submarine Racing Club had an extreme advantage over every single team, since a digital twin model was available thanks to the ShipConstructor software licenses provided to the team's Platinum Sponsors (**SSI Corporate**).
- During this event, the UVic Submarine Racing Club was able to accurately present all systems of the submarine to the public and the judges, thus allowing the team to win the **BEST PRESENTATION Prize!** Printed marketing also played a big role on this Prize, since it caught the attention of multiple people.
- Even though the day went by very slow, (9 am to 4 pm in a conference room) judges came to our booth incognito. Teams did not have knowledge of this until the event finished. This is a clear example of why it is important to always have a professional behavior, and not to let

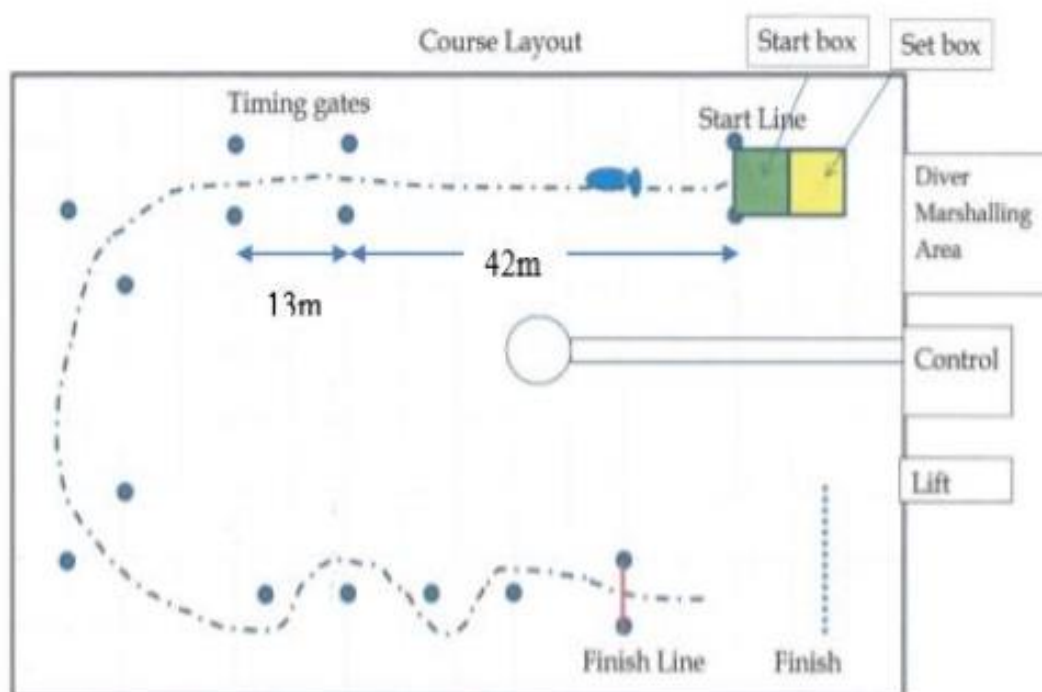
your guard off. There is always someone looking at you, and the UVic Submarine Racing Club members did an extremely good job at presenting the professionalism of the team.

- Overall, our performance during this day showed the power of digital twinning, and the power behind being professional at all times.

Sunday 8/Jul/2018 (Day 8) - DAY OFF

Monday 9/Jul/2018 (Day 9) - First Day of Racing:

- This was officially the first day of races, but as mentioned before, only those who passed the wet inspections will be allowed to start racing. Teams were broken into two heats of 6 teams each, which got divided into morning and afternoon racing. The afternoon heat consisted of those teams who did not pass their wet inspection, and the morning heat consisted of the teams who did pass their wet inspections.
- Heat 1 raced from 0900 to 1230, and heat 2 raced from 1230 to 1600. The order of racing was determined at the captain's meeting through a draw system.
- The racecourse on the first day of racing was relatively easy, with the slalom gates placed staggered, thus allowing teams to basically pass the gates on a straight light with a slight turning motion to avoid collision. As the competition progressed the racecourse got significantly more complex with the slalom gates placed in line. In essence, the racecourse consisted of a straight line for a speed "sprint", followed by a 25m 180 degree turn, and a slalom course on the way back. As the week progressed, the slalom poles got placed such that the subs had to weave between them.



- Despite being team number 4 in the morning Heat, **Chinook was the first team to successfully complete a race, plus doing so without any faults.** This was a very privileged position that accounted directly to reliability points. We were able to race two times this day:
 - **Race 1: 3.9 knots top speed → Time 02:02.4 → “0” faults**
 - **Race 2: 2.5 knots top speed → Time 02:24.6 → “0” faults**
- Usually if the submarine races in the morning, all the afternoon is devoted to tuning and fixing the submarine. After the morning racing, the team had no major breakdowns to the submarine, other than tightening the steering cables for the diving planes, which took only 10 minutes of our time. This proved that we had built an extremely reliable submarine.
- The team dynamics after the first week of the competition were stupendous! The President of the club (Manuel Dussault Gomez) made sure that 2 full-team meetings with NO exceptions were taken place every single day, one as soon as you got back to the caravan park every night, and another one before leaving every morning. These meetings were crucial to discuss the performance of the day, as well as any adjustments the team feels should be made the next day. Morning meetings reiterated what was discussed the night before, and they helped set the mood for the day, this way everyone arrived to the basin with a task already assigned.
- Organization was key during this event. And the UVSRC excelled at being organized and professional towards every problem presented.
- It is worth mentioning that the team did a small repair on the Kort nozzle of the submarine this day. The manufacturing procedure of the Kort Nozzle made it impossible for the team to successfully seal the nozzle when immersed in the water. This caused leaks of water into the nozzle when immersed in the pool, which changed the weight of the submarine at an unknown rate. This change of weight made it hard for the team to ballast the submarine perfectly. In order to solve this issue, the team decided to drill holes in the nozzle which deliberately flooded the nozzle instantly as soon as it got immersed in the water. This solution allowed the team to ballast the submarine perfectly every time before each race.

Tuesday 10/July/2018 (Day 10) – Second Day of Racing:

- The UVSRC got placed on the morning heat again, as the second team to get in the water. As the competition progressed, teams became more agile in their processes, thus more races were able to be completed in each heat.
 - **Race 3: 3.8 knots → Time 01:47.5 → “0” faults**
 - **Race 4: 3.8 knots → Time 02:08.4 → “0” faults**
 - **Race 5: ABORT**
 - **Race 6: 4.4 knots → Time 01:37.8 → “0” faults**
 - **Race 7: 4.2 knots → Time 02:20.8 → “20” faults**
- According to the global scoreboard, which accounts for all elements of the competition (dry inspections, wet inspections, presentations, and underwater runs), at this point in time, the **UVSRC was currently standing in 3rd place out of 12 teams** attending the competition.
- We were confident that if we kept working hard and kept striving to be the best, we could be able to remain amongst the top 3 competitors. We stood very closely behind two of the most

veteran teams, OMER XI from ETS in Montreal, and WASUB from TU Delft & VU Amsterdam, both of which have attended the submarine races for over a decade.

- We are proud to say that with a budget of only \$35,000 CAD our submarine was stepping on the toes of very advanced vessels like OMER XI and WASUB, which have budgets of \$80,000 CAD and 70,000€ respectively. We hope this motivates the University of Victoria to keep supporting our Club as the eyes of the world are currently standing not only on our human powered submarine, but on the University as a whole.
- Having completed six races in two days with minimal faults and no major breakdowns of the submarine, gave our club extremely good reliability points, and it proved that our submarine was fully operational, and built to last. The only limits to our performance was the training the pilots had prior to the competition. If more training was allocated in a bigger pool or a lake where big turns could be practiced, our pilots would have been more comfortable underwater, and they would have gone faster on the timing gates and through the slalom poles.
- The one abort the UVSRC had on this day was due to the hatch of the submarine opening 20ft from the start line. This was due to the fact that a piece of foam disengaged from its restraining Velcro components, making the pilot hit the foam with his rotating foot, thus hitting the hatch release lever mechanism and opening the hatch prematurely. In order to solve this problem, the team added more Velcro to the foam to secure it properly to the hull of the submarine.

Wednesday 11/Jul/2018 (Day 11) – Third Day of Racing:

- Wednesday is usually the “basin open house” where industry people and media come visit the premises. We had both people from Babcock UK and the BBC approach us. We made sure the station was always clean and tidy, as well as all team members wearing matching shirts to impress the press. Racing procedures were the exact same as Tuesday.
 - **Race 8: ABORT**
 - **Race 9: 3.9 knots → Time 02:20.6 → “0” faults**
 - **Race 10: 3.7 knots → Time 02:19.0 → “16” faults**
- Wednesday's day of racing was relatively hard for the team. The slalom poles were placed in line with respect to each other, thus making it hard to turn the submarine without any faults. Other more experienced pilots from other teams (specially the pilot from HPS Atlantic), had trained extensively to turn their submarine in lakes and the ocean, thus giving them the edge since their pilots were more experienced. In order to solve this issue from future competitions, the pilots of our submarine NEED to train turning the submarine and timing the correct turning around the slalom poles in lakes across Victoria BC. Special permission will be needed from the University staff in order to perform this task, and possible support from Navy divers and Diving instructors will be needed as well.
- The abort on the first run of the day was due to the same issue as before. In order to solve this pressing issue, the team decided to add a spring to the hatch release lever, thus locking the mechanism in place. The tension of the spring was set so that safety divers from outside of the submarine could open the hatch with a small force acting on the release button. The capability of the pilot to open the hatch from the inside of the submarine was not taken away

from him, the only thing that changed was the amount of force needed to move the lever. The addition of the spring solved all the problems the club had in hand.

- As a side note, there weren't many social events organized by the competition except for a BBQ on the first week and a guest speaker / dinner on the Wednesday of the second week at a navy museum. Both of these events were optional. There were very few chances where you got to network and got to know the people in the other teams. Even though you saw them every day for 2 weeks, people were usually either too busy, or too focused on their own submarine to become "friends". Some of our members didn't attend these events due to school assignments.
- After Wednesday, the UVSRC dropped to 4th place due to the experienced diver from HPS Atlantic completing the runs flawlessly. This however, motivated the team to come even stronger on the last day of the competition towards the eISR trophy.
- Due to our successful completion of the races, the UVSRC was still ahead of every other team in the amounts of races completed with the least amounts of faults, thus giving the club extremely good reliability points. In addition, all the issues presented were solved within minutes, thus showing the judges the capability of the team to troubleshoot and work as a team to solve a problem.

Thursday 12/Jul/2018 (Day 12) – Fourth Day of Racing (Last day of racing for the eISR Trophy):

- The UVSRC was placed on Heat 2, team number 3. This was the only day we raced in the afternoon, and it made a significant difference. The afternoon Heat always went a lot slower, and you got less races done. It felt like a very long day, and we were all tired by the time we actually got in the pool. The draw for the heats was unlucky that day, and we got placed on the afternoon heat due to luck. The importance of this day was to prioritize clean, flawless runs; however, the course was extremely hard with the slalom poles staggered in such a way that extremely sharp turns were needed. This gave the edge to other teams with more experienced pilots that had gone to previous competitions over the years, like the pilots from OMER, WASSUP, and HPS Atlantic.
- **Race 11: ABORT**
- **Race 12: 4.0 knots → Time 02:22.3 → "16" faults**
- The club knew that we did not have experienced pilots, thus we decided to add static fins to the submarine in order to aid the turning radius. In order to do so, we manufactured two static fins using our spare rudder, and spare 3-D printed pieces that conformed to the shape of the hull. We used BELZONA 2-part epoxy to assemble everything together, and we drilled four holes in the hull of the submarine to install the static VERTICAL fins just in front of the center of buoyancy. These fins effectively helped the submarine turn, however, they were too thick of a profile, and they added drag to the submarine. We knew exactly the consequences, and thus we decided to sacrifice speed for maneuverability.
- During the first run, we noticed that the added static fins were extremely buoyant, and it was challenging for us to ballast our submarine perfectly. This caused us to ballast our submarine a little too negatively buoyant, which caused the pilot to hit the bottom of the pool at the last slalom pole. When the submarine hit the bottom of the pool, it lifted the guide line rope, which

in turn got tangled in the propeller blades and stopped the submarine 10 feet from the finish line causing an abort.




- This issue of being negatively buoyant was quickly solved, and the team decided to remove the bottom vertical fin for the second race of the day, which worked perfectly. Completing a race that day meant that our submarine had a grand total of 9 completed races with 52 faults and 3 aborts in total, less than any other team in the competition, thus giving us the **TROPHY FOR THE MOST RELIABLE SUBMARINE OF THE COMPETITION**. This trophy is one that we are extremely proud of, as it demonstrated the quality of our design and manufacturing phase, and the perfect performance of all of our divers/pilots, and all of the members of the club who did not attend the competition. Note that our dive squad was by far the best diving squad of the competition. Our submarine was perfectly ballasted within minutes, and we were the team that took the least amount of time in the set box getting the submarine ready for the race. If more time were dedicated to train our pilots in a lake where they can practice timing the turns on a slalom course, we would have definitely come in second place, if not first at the 2018 eISR competition. Please refer to the scoreboard at the end of this RECAP REPORT.

Friday 13/Jul/2018 (Day 13) – Fifth Day of Racing (Top Six Team Race for Agility/Endurance Trophy):



- The more reliability points you were able to secure throughout the week, the more you increased the chances of racing until the very last day. Successfully passing Wet Inspection was a major component of this. The UVSRC successfully got to race on the last day with the top 6 submarines in the entire world.
- On this day, only the 6 best teams in the water got to race back to back. This was a very fast paced day, with all teams competing at their fullest potential. Everything moved a lot faster as all teams are very qualified and everyone is in a time crunch to get as many runs in as possible. The racecourse remains the same, but submarines **go around the pool twice on each attempt**. Most teams like Wasub and OMER XI used this day to break world records in speed and push their submarines to the limit. Hence the importance of having a good number of flawless runs throughout the week in order to use Friday for speed focused attempts.
- This day did not count for the eISR trophy, thus the UVSRC did 4 runs on the course testing the limits of the submarine and allowing for our president (Manuel Dussault Gomez) to have a

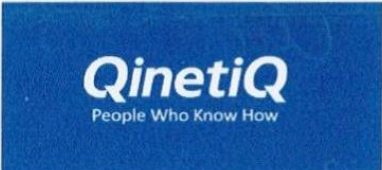

go for the first time as the pilot. This day was extremely rewarding for the team members, since we knew we were amongst the best of the best!

- This was also the day when all submarines needed to be repacked and ready to leave the facilities, as well as the award ceremony dinner. The schedule looked as follows:
 - 8 am to 9 am
 - Arrive at Basin, get diving equipment ready to start racing.
 - 9 am to 2:30 pm
 - Back to back races with short 15-minute break in the middle for lunch. In the meantime, all non-racing teams got to pack their submarines.
 - 2:30 pm to 5:00 pm
 - Packing of all submarines. All teams were in a time crunch, as everything needed to be done and repacked by 5:00 pm. All non-divers packed tools and other components while divers were in the pool.
 - 5:00 pm to 6:30 pm
 - Everyone got ready for the Gala event (award ceremony).
- The award ceremony was stupendous, since the UVSRC WON three very prestigious trophies:
 - **MOST RELIABLE SUBMARINE OF THE COMPETITION**
 - **BEST PRESENTATION**
 - **BEST ENGINEERING DESIGN REPORT**
- The UVSRC finished in **4th place overall** as seen in the scoreboard below:

 Leaderboard								
Position	Team	Boat	Design Report (Max 24)	Dry Inspection (Max 12)	Wet Check (Max 8)	Performance (Max 48)	Reliability (Max 8)	Overall Score (Max 100)
1	Quebec	Omer 11	18.0	11.0	8.0	40.0	7.0	84.0
2	Delft	Wasub VIII	15.8	10.0	8.0	35.0	3.0	71.8
3	Florida Atlantic	Atlantic	14.8	8.7	6.0	35.0	7.0	71.5
4	UVic	Chinook	19.8	10.3	8.0	24.0	8.0	70.1
5	Montreal	Archimede7	17.1	10.3	8.0	22.0	4.0	61.5
6	Rhine-Waal	Rivershark	17.0	10.7	7.0	12.0	5.0	51.6
7	California San Diego	Vaquita	16.6	10.0	8.0	10.0	2.0	46.6
8	Michigan	Bluefin	16.5	9.3	8.0	4.0	0.0	37.8
9	Gdansk	Nautilus	13.8	9.7	8.0	4.0	2.0	37.4
10	UBC	Sk'chuck IV	17.7	10.3	8.0	0.0	0.0	36.0
11	Washington	Knotty Dawg	17.7	10.7	6.0	0.0	0.0	34.3
12	Texas	H'balooga	14.1	9.0	7.0	1.0	0.0	31.1

Sponsors:

- As seen in the scoreboard above, the competition gets marked in the following 5 different categories: DESIGN REPORT (24), DRY INSPECTION (12), WET INSPECTION (8), PERFORMANCE (48), and RELIABILITY (8).
- The UVSRC HAD **top marks for 3 out of the 5** grading components (design report, wet inspection, and reliability). This represents the quality of the club, and the hard work of all the engineering and non-engineering students who took part in this FIRST YEAR of the club, something that we are extremely proud off.
- The marks on the dry inspection, as mentioned previously, was ambiguous since all the divers were not present at the time, including the president of the club. The performance mark was done solemnly on the speed at which the submarines completed the racecourse. This means that the faster you completed the course with no faults, the best performance points you had. Due to the lack of experience of our pilots and this being our first competition, plus the time allocated for the entire project **since September 2017**, we were relatively happy with our performance. We truly believe that in the following years, our pilots will be more experienced, and they will be able to complete the racecourse and time the turning of the gates faster, thus placing us as potential overall winners of the competition.
- As seen in the scoreboard above, **the UVSRC was 1.4 points and 1.7 points (out of 100) away from 3rd and 2nd place respectively!!!** This is **astounding!!** Taking into account that this was our first year ever at the competitions, and the teams who beat us have been going to the competitions for DECADES!
- This project started with an idea, and it quickly became a reality, and an extremely successful story not only for the club members, but for UVic and CAMOSUN as a whole, along with all the sponsors and donors who supported the project. I, the first UVSRC president Manuel Dussault Gomez, hope that our success motivates future club members to aspire to be the best students, and the best Marine Systems Engineers in the world. From now on, the human-powered submarine community will be looking out for the UVic Submarine Racing Club as a top contender for the eISR and the ISR trophies.

Saturday 14/Jul/2018 (Day 14) – Travelling:

- The 10 UVSRC team members travelled from Gosport England on a WESTJET flight to Vancouver BC. From there, members took a 1.5-hour ferry to Victoria back home after an extremely successful eISR competition.

Closing Remarks and Recommendations:

- As mentioned above, dry inspections are not scheduled and occur very spontaneously. During our team's familiarization dive (in which Manuel, Aiden, Dan, Russ, Jaryd and Andres were in the water,) judges came over to our station to conduct the inspection since our submarine was fully assembled. For future years, always have someone at the station ready to speak about the project in its entirety, regardless of what section they were involved in. Anyone attending the competition should have a clear understanding of all main components of the submarine. Although our dry inspection went okay, our team members did not realize it was the actual inspection until it finished, which could have perhaps affected the grade we were given. Treat everyone approaching your station as a judge, you never know who is who! It's also a good idea to bring the posters for this day.
- Remember that you are there to compete, and it's best to stay focused and have a good night sleep. The best teams in the competition were always in bed by 10pm, and they had

taken their time to rest. It will be long, stressful, and exhausting days, all of which will affect your performance in the pool.

- Always be professional, friendly, and nice. Try to be the nice group of people that help everyone out (either lending diving equipment or helping out), and show that you take the races seriously.
- Be positive and cheerful. Always cheer when our team finishes every run, as well as other teams. You want to have fun and show others that you are enjoying your time at the competition. It will be hard, and you will be tired, but every little moment is worth it! Cheer for other teams when they have good performances, always wish them good luck, and have a friendly face. It may sound cliché, but try to be the nice and friendly Canadians. You want to be the team other teams cheer for when everyone gets disqualified for Friday!
- Go to the supermarket and buy collective groceries! Make oatmeal for breakfast every morning, bring peanut butter and crackers as snacks, and cook pasta or sandwiches for lunch at the basin! You will have to rely on each other as a group 24/7 throughout the competition. There is no room for individualism, whether you like it or not.
- Bring silverware! Unfortunately, one day we “forgot” to bring spoons, forks, and knives and ended up using cans and Mason jar lids as cutlery... not very fun.
- Have lunch together. We made a deal to always have lunch together and ensure everyone is eating at the same time. This boosted the entire team's morale as we use it to have quick “mid-day pow wows” to talk about immediate race performance, ideas for improvement, as well as ensuring everyone has a meal. We had a day in which two members didn't have lunch because no one saved them food.
- Divers must have all equipment sorted and ready to dive at any time. If switching divers and/or pilots, ensure to communicate every morning before arriving to the site who will be going underwater and when (i.e. switch diving team and pilot every two runs or so). Non-diving team is crucial for the success of this stage, as divers are limited to what they can do when wearing a full gear. It's important to have a designated SLO (Surface Liaison Officer) (more details on this role are outlined in the “Racing / Wet inspection procedures” document on the event website) and DO NOT rotate this position. This is the only team member communicating with race coordinators and there is a very structured communication that is used, it is best if one person masters this process to help gain more time underwater. All other non-divers must be ready to refill tanks at any given point as well as aiding with finding, borrowing, or changing diving equipment for divers.
- Designate a marketing and business person to record everything and keep social media accounts updated. Ideally, a number of business students should be doing this job to keep material consistent and in one source. Having a business lead with a business team for the team IS CRUCIAL! A group of people that portray the face of the club on all social media and the website, and a group of people that are in constant communication with all donors and sponsors, and in constant search of support. This position is for professional members that want to gain more experience on how to run a small organization. Business students are encouraged to join the club for this position, and ideally there will be 3-4 business students managing this sector of the club effectively with a team lead.
- Keep working hard, and remember that everything is worth it in the end. The team who works the hardest is the team who wins, it's that simple. Budget plays a big role; however, you can still do amazing with a limited budget.
- Get more pool time (ideally for free) and try to train on a lake were you can set up a slalom course for the pilots to practice. After speaking with all the other clubs, they all GET FREE POOL

TIME, whereas we were the only club that got our University to charge for our pool time. This directly affects our performance at the competition, thus I strongly encourage the next generation to push hard for free pool time or training at a lake.

- Be professional! This is the single most valuable tip I have for everyone. It is now were you network with companies and develop your portfolio for your future career.
- HAVE FUN. Always try to boost the morale of the group by having events and making everyone feel comfortable around each other.
- LAST BUT NOT LEAST, I would like to thank all of our sponsors and donors, specially our PLATINUM SPONSORS (BABCOCK, SSI, and ROCKFISH DIVERS), without your support, this amazing project wouldn't have been feasible. I would also like to thank UVIC ENGINEERING for all your support, specifically the DEAN's OFFICE staff, for putting up with our shipping documentation errors and for making it all happen. This year was our very first year in operation, and we learned a lot from our logistical mistakes, something that will get passed on to the future generations of the club.
- Please find the overall results and trophies in the event webpage, and all of our footage from the competition in our google drive:
 - <https://www.subrace.eu/>
 - <https://drive.google.com/drive/folders/1mr6-sKGTmV24aaQzX8YfNWhl0D0CArQ1?usp=sharing>

The logo for Babcock, featuring the word "babcock" in a bold, blue, sans-serif font, with a small "TM" trademark symbol to the upper right.

