U.S. NAVAL SEA CADET CORPS
CHART YOUR COURSE

Dear 2017 Sea Perch Qualifier Team:

Welcome to the 2017 Sea Perch Regional Qualifier. We wanted to give you some "nuts and bolts" information so your experience is positive. We wish you and your team members the best of luck.

To make your competition experience as successful as possible, here is some logistical information:

VENUE: Los Osos High School, 6001 Miliken Ave., Rancho Cucamonga, CA 91737. Our event will take place in the pool facility. Please park in the parking lot off Miliken Ave. and walk to the pool.

QUALIFIER RULES: Attached to this letter is a set of Qualifier Rules. Please review them carefully. Most of the information has been taken directly from the National SeaPerch website (www.seaperch.org). We encourage you to visit this site; previous participants have posted material on a blog page and this information can be helpful as you prepare for this event.

EVENT ROTATION SCHEDULE: Prior to April 22nd, an EVENT ROTATION SCHEDULE and a LIST OF PARTICIPATING TEAMS will be sent to those who have registered. Each team will be given a "first event start time." Please plan to arrive an hour or more before your first event but no earlier than 7:30 AM to check-in. No events will start until after Morning Colors at 8:00 AM.

At check-in, you will be provided with a TEAM REGISTRATION sheet to verify important information (i.e. spelling of names, etc.). Once you have cleared registration, your vehicle will be checked and certified. Following "vehicle certification," you will be given directions on where to go.

LUNCH: Lunch will be provided to all youth team contestants. Adults, family, friends, and non-contestants may purchase a lunch plate for $5.00. Lunch is served between 11:00 AM and 1:00 PM.

CLOSING CEREMONIES: A small closing ceremony will take place 30 minutes following the end of the last event. At that time, we will announce the top-place finishers in each category – Navy League Cadet Corps, Naval Sea Cadet Corps, and Non-Sea Cadet Team. These teams will advance to and have the opportunity to register for the 2017 National Competition.

UNIFORM OF THE DAY/SUPPLIES: Sea Cadet members – Working/Alternate Uniform as authorized; all organizations, please dress appropriately as required by your group. CLOSED-TOED SHOES ARE REQUIRED. We recommend that you bring sunscreen, EZ-Ups (if you have there will be space outside the pool to set-up), and Camp Chairs as seating at the pool is limited.

QUESTIONS and CONCERNS: If you still have further questions, please contact LTJG Suzanne Davis via email (sdaviskowahl@gmail.com).

LTJG Suzanne Davis, NSCC
Sea Perch Registration Officer

Attachments:
Qualifier Rules

Sr. Regional Director | Pacific Southwest Region Eleven
3727 West Magnolia Blvd., Ste. 215 | Burbank, CA 91505-2818
P: (818) 822-6818 | F: (818) 279-6800 | srd@nsccpsw.org

United States Naval Sea Cadet Corps
2017 SeaPerch Regional Qualifier
Los Osos High School
April 22, 2017

Event General and Specific Rules

Technical Inspection and Compliance:

After a team has completed the check-in procedure they will be directed to the Triage station for vehicle compliance and technical inspection. Vehicle inspection and compliance will be the same for both Middle and High School Classes, and both Sea Cadet and Non-Sea Cadet Teams.

The vehicle will be inspected for having been built from those parts available in the standard SeaPerch kit, with the addition of those parts added which will not exceed the $20 limit and comply with the limitations spelled out below and within the SeaPerch.org website for both High School and Middle School classes.

To assure each team is using the stock motors specified the combined wattage will be measured and recorded on the team check-in sheet. If a motor is replaced during the competition this process will be repeated.

The appurtenances used for the challenge competition must be non-removable but may be retracted or swung out of the way for a more streamline effect during the obstacle competition.

Upon completion of technical inspection each vehicle will be marked with a compliance sticker and that vehicle may be the only one used by any team for the pool events.

Vehicle Design Rules:

Teams are encouraged to think outside the box and change the shape and configuration of their SeaPerch ROV.

Stock Class (High School and Middle School)

Teams may utilize materials (quantity and components) equivalent to one SeaPerch kit. Teams have a budget of $20.00 in addition It is the actual value of the modifications that must be $20 or less. Donated material will be assessed at what the cost would be to procure the material. The $20 limit is for cost of the materials utilized on the final competition vehicle. Reasonable spare parts (one set of thrusters (3) and one controller) are not included in this budget.

Proof of budget compliance should be made available to the judges upon request.

3D printed parts will be costed out at $0.05 per gram. All motors must be waterproofed. Hooks and attachments MAY NOT be added/removed between competition rounds. They may be retractable or swing out of the way. Additional NON-stock motors may be utilized for actuation or other non-propulsion uses. Teams may only utilize stock SeaPerch motors for propulsion (Jameco Electronics P/N 232022).

Teams may only utilize three (3) thrusters. A thruster is defined as a means of propulsion for the SeaPerch, normally but not limited to a motor and propeller assembly.

Teams will design for and utilize a 12-volt power source.

Power source other than the included kit battery or venue supplied power is not permitted.

ROV thruster controls shall use simple switches only, no power conditioning or pulse-width modulation (PWM) controls are allowed in Stock Class. Use of a fixed or variable resistor to reduce voltage is acceptable.

ROVs shall fit thru an 18" hoop.

Scoring and Rules:

Obstacle Course

Teams are required to traverse each of five 18" rings, surface and return through the five rings. All rings must be traversed in both directions. Fastest elapsed time wins. Teams will have two attempts at the course during their 15 min time allocation.

1. Only two team members are allowed on the pool deck during the competition.
2. The rings shall be traversed in order, closest to the wall first.
3. The SeaPerch must move only under their own power. It is prohibited for a team member to pull the vehicle by the tether, or attempt to maneuver the ROV using the tether. This action will incur a 2-minute penalty per occurrence.
4. In the event that a vehicle is inadvertently interfered with during a competition, or a malfunction of a vehicle's parts (i.e., the motor) occurs that is beyond the design and construction, the lead pool judge will have the authority to provide the team time to fix their vehicle and to allow them to compete later.

Scoring

The following scoring method will be follows.

1. Check the Team Name and Team Number prior to the start of the event.
2. Each Vehicle must be touching the wall of the pool prior to start.
3. The score sheet will be marked for each ring traversed.
4. Time is stopped when the SeaPerch returns and touches the wall. The SeaPerch does not need to be on the surface at the finish.

Note: Time scoring will be recorded to the 100th of a second for the criteria of breaking a tie.

Obstacle Course

Challenge Performance *(Goal: All gates in shortest amount of time)* Judging Rubric 2013

School Name:

_____

Team #:

_____

Elapsed Time
(in hundredths of a second):

_____._____

Diver assist?
(add 2 min)

☐

All Gates Cleared:

☐

Scored Time
(in hundredths of a second):

_____._____

Gates Cleared (Outbound):
Check each when cleared:

Gate 1_____

Gate 2_____

Gate 3_____ **All Outbound Gates Cleared:** _____

Gate 4_____

Gate 5_____

ROV surfaced _____

Gates Cleared (Inbound):
Check when cleared:

Gate 1_____

Gate 2_____

Gate 3_____ **All Inbound Gates Cleared:** _____

Gate 4_____

Gate 5_____

ROV touched wall_____

Challenge

Scoring: Maximum number of points in the shortest amount of time. The clock stops when the team identifies they are done, surfaces and touches the wall with the vehicle. Teams may stop the clock at any time, but it will not be restarted. Vehicle must return to the wall nearest the start point. Teams must inform the judges at the time if they wish to stop the clock and lock in their scoring. Point scoring will be tallied upon completion. Points scored and knocked off are not counted.

Rings:

1. Rings can be placed on the platform for 1 point
2. Rings can be placed on the upper spikes for 2 points
3. Rings can be put on the Zig-Zags for the points assigned by the Qualifier specific rules, they need not be the same as the National Competition.
4. Only one ring scores per Zig-Zag (additional rings will not be scored) Rings on fittings (elbows) score the lower of the point options

Cubes:

1. Cubes can be placed on the platform for 1 point (stacking gains an additional point)
2. Cubes can be put on the upper spikes for 2 points
3. Cubes hung in the Zig-Zags double the ring points (no ring no points)
4. Cubes need only be hung by one side, shaft need not go all the way through cube.

CHALLENGE COURSE SCORING SHEET

Team:_____

Judge:_____

Middle School:_____

High School:_____

Left Rack Cube Hung (2x ring points) Points _____

Middle Rack Cube Hung (2x ring points)Points _____

Right Rack Cube Hung (2x ring points)Points _____

Quantity on Platform

Rings (1pt) 1 ____ 2_____ 3____

Cubes (1pt) 1____ 2_____ 3 ____

Stacked (2pts) _____

Notes:

Ring/Qube Quantity on Spike

Rings (1pt) 1 ____ 2 ____ 3 ____

Cubes (1pt) 1____ 2_____ 3____

Diver Assist Required (+ 2min)

Finish Time M_____:_S____._____(x100)

Note: Each team will be allowed a maximum of 1 run with a max time of 15min.

ENGINEERING NOTES

Submission: Submit Engineering Notebooks in PDF format to Michelle Golding at mgolding@seacadets.org **no later than April 12, 2017.**

Please bring a hard-copy of your submitted Engineering Notebook with you on the day of the event.

Engineering Notebook General Information:

1. Using an Engineering Notebook provides a good learning experience and allows students to demonstrate their understanding of engineering principles and design concepts.

2. The Engineering Notebook is used to measure the team's ability to document the engineering design process used to design and modify their SeaPerch to meet the pool challenges.

3. The Engineering Notebook is not intended to document the construction of the standard SeaPerch ROV.

4. The physical notebook can consist of hand sketches, photos, computer- aided design (CAD) drawings, handwritten notes, and graphs. Photos, CAD drawings, and other computer generated entries should be taped to the notebook page and labeled.

5. Hand written text and sketches must be in INK, not pencil.

Required Content, Format, and Limitations:

The SeaPerch Engineering Notebook should include:

1. Front matter

   a) Cover/Title Page
   b) Project Title
   c) Team Number and Team Name
   d) Photo of final ROV
   e) Date the notebook was completed

2. Team Information Page
   a) School or club name
   b) School district (if applicable)
   c) City and State
   d) Name and email address of teachers, coaches, mentors, and advisors (or team leader if the POC is a student)
   e) Team member names, grade levels, and role in the project. Use first names only for students. If two or more students have the same first name, use an identifying letter following the first name.

3. Table of Contents Page

   a) List page title or description and page numbers.
   b) Reference citations of research such as books, articles, and website addresses.
   c) Engineering Design Process

Engineering Notebook Design General Notes:

1. Provide details of each step taken in the engineering design process using the SeaPerch Challenge pool events as the project problem/goal.

2. Provide sketches, drawings, charts, and other graphics and written documentation describing solution and design concepts, design iterations, tests performed, and test results.

3. Include engineering and scientific terms and concepts to demonstrate that the team understands the challenges of constructing and operating an underwater ROV.

4. All pages should be numbered and listed in the Table of Contents.

5. The following resources are found online at SeaPerch.org and are used for the basis of the qualifier rules. They may be adjusted to meet the conditions of the Qualifier.

   MIT Dept. of Mechanical Engineering, Instructions for Using Your Laboratory Notebook http://web.mit.edu/me-ugoffice/communication/labnotebooks.pdf

   OSU College of Arts and Sciences, GUIDELINES FOR KEEPING A GOOD LABORATORY NOTEBOOK https://goo.gl/1Z7rkZ (Google Shortened URL)

2017 National SeaPerch Challenge

Engineering Notebook Challenge Scoring Rubric

Division _____ Team Name _____ Team Number _____ Total Score _____

School Name _____

Cover/Title Page		Points awarded
Project title	Award 1 point each if page element is included.	
Team name		
Picture of ROV		
Date of notebook completion		
Creativity bonus	Subjective Bonus (1 points)	

Section Score
5 Possible Points

Team Information Page	Points	Points awarded
Team Number/School or Club Name	Award 1 point each if page element is included.	
City, State		
Main contact name and email address		
Team members' names and grades		
Team members' role(s)		

Section Score
5 Possible Points

Table of Contents Page	4 to 5 points	2 to 3 points	1 point	0 points	**Section Score**
A. Page title or description and page numbers B. Reference citation (citations listed are traceable to the reference)	• Professionally-laid-out • 100% accurate (page title/description and page number match correct page in notebook) • Ample content • 100% of references cited are traceable	• Professionally-laid-out • 1 to 2 inaccuracies (page title/description or page number does not match correct page in notebook) • 1 to 2 inaccuracies in references cited	• Not Professionally-laid-out • 1 to 2 inaccuracies (page title/description or page number does not match correct page in notebook) • More than 2 inaccuracies in references cited	Table of Contents Page not included	5 Possible Points

Engineering Design Process Section	Excellent	Good	Fair	Needs Improvement	Element Score
Content is related to the Engineering Design Process (EDP). (Specific EDP steps do not have to be listed, but the content should show the use of the process.)	36 to 45 points • Content as a whole clearly demonstrates that the EDP was followed. • Shows design iterations. • Clearly describes at least 4 Principles of Engineering embedded in the process. • Describes design deficiencies of initial designs. • Describes why final design was chosen. • Test results are clear and validate design decisions.	21 to 35 points • Majority of content clearly demonstrates that the EDP was followed. • Shows design iterations. • Clearly describes at least 3 Principles of Engineering embedded in the process. • • Does not describe design deficiencies of initial designs. • Describes why final design was chosen. • Test results are clear and validate design decisions.	11 to 20 points • While the content demonstrates the use of the EDP, it was not completely followed. • Clearly describes at least 2 Principles of Engineering embedded in the process. • Design iterations not completely shown. • Does not fully describe why final design was chosen. • Test results are unclear or do not fully validate design decisions.	5 to 10 points • It is not clear that the EDP was used. • Design iterations are either not shown or are not completely described. • Specific Principles of Engineering are not described. • Test results are either not shown or do not validate design decisions.	45 points max
Use of graphics (illustrations, sketches, CAD drawings, photos, diagrams, charts, and graphs)	8 to 10 points • 100% of design iterations are described using graphics. • Multiple types of graphics are included. • Test results include the use of graphics.	5 to 7 points • 90% design iterations are described using graphics. • At least 2 different types of graphics are included. • Test results include the use of graphics.	2 to 4 points • 50% design iterations are described using graphics. • Test results do not include the use of graphics.	0 to 1 point • 25% or less graphics were used.	10 points max each element
Explanation of graphics	• 100% of graphics are described. • Descriptions are clear and lead to a complete understanding of the graphics.	• 90% of graphics are described. • Most descriptions are clear and lead to a complete understanding of the graphics.	• 50% of graphic are described. • Most descriptions are unclear or lead to an incomplete understanding of the graphics.	• No explanation of graphics.	
Use of engineering and scientific terms	• At least 7 engineering and scientific terms are used throughout the notebook.	• Between 4 and 6 engineering and scientific terms are used throughout the notebook.	• Only 1 or 3 engineering and scientific terms are used throughout the notebook.	• No engineering or scientific terms used.	
Professional appearance	• Professional and neat appearance throughout the notebook.	• Professional and neat appearance in the majority of the notebook.	• Clear and neat appearance in only a few pages of the notebook.	• Very sloppy throughout the notebook.	
				Section Score 85 Possible Points	