

Engineering & Communication: Engineering Evaluation

School name and # AS IT APPEARS ON THE OFFICIAL LIST:

Judge's name:

1 0 = Yes (1) or No (0) 3 2 1 0 = 3: Exceptional, 2: Excellent, 1: Good, 0: Poor or missing

SCORE

Teamwork/Presentation

18 pts max

Company was prepared for the presentation	1 0	
Company presented judges with a copy of its company spec sheet as well as any updated technical documentation (e.g. revised electrical schematic)	1 0	
Presentation was well thought through, organized, and articulate	3 2 1 0	
Presentation covered the design, building, troubleshooting, and testing process	2 1 0	
Presentation highlighted design innovations/creative ideas	2 1 0	
Company demonstrates an understanding of the ROV systems, including the science behind them, and operations	3 2 1 0	
Each member participated and understands the basics of the vehicle plus details about at least one system	2 1 0	
Role of each member of the company is acknowledged during the presentation	1 0	
Members demonstrated they encountered challenges with determination and resolve	2 1 0	
Company demonstrates an understanding of the role that ROVs play in the mission theme	1 0	

Overall Design and Workmanship

12 pts max

Vehicle is ready for the water	1 0	
Tested prior to the event	2 1 0	
<i>Note: Two points for entire vehicle testing prior to event; 1 point for component testing, but not integrated vehicle.</i>		
Company describes troubleshooting technique(s) that demonstrates an understanding of the technical issues and presents a step-by-step process for addressing them	2 1 0	
Meets competition guidelines for construction (material, non-hazardous materials, etc.); followed design & build specs	1 0	
Components easy to access for maintenance & troubleshooting	2 1 0	
Is robust; constructed for durability with attention to craftsmanship and marketability to potential customers	2 1 0	
Built to accomplish mission	2 1 0	

New in 2013! Safety

10 pts max

Company describes its safety philosophy and practices during design and development	2 1 0	
Presentation included specific safety features of vehicle	2 1 0	
Vehicle visually displays warning labels and safeguards	1 0	
Fuse(s) in place on the positive side	1 0	
Company described safety precautions necessary while handling/operating the vehicle	1 0	
Company developed and shared a copy of its own safety checklist or protocol that is organized and well-thought through	1 0	
<i>Note: The checklist is NOT the safety inspection checklist provided by the competition. If the competition's is used, score as a 0.</i>		
Vehicle built according to the competition safety requirements and has passed the safety inspection (inspection sheet presented to judges)	2 1 0	

Systems Design and Operation

Overall Vehicle System

13 pts max

Company demonstrates understanding of vehicle systems and operations	2 1 0	
Vehicle contains original concepts and unique designs	2 1 0	
Cost is decreased with design modifications	1 0	
Functionality is increased with design or modifications	1 0	

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Original vs. commercial design

The majority of the components are designed and built by the company. 3 2 1 0
The company effectively describes the design and functionality of the components of those components with respect to the mission tasks.

OR

The company uses a number of commercial components. 3 2 1 0
The company effectively describes the rationale for choosing each commercial component and the functionality of those components with respect to mission tasks.

New vs. re-used components from "last year"

The majority of the components new this year. 3

OR

The company re-uses components built by company members in prior years. 3 2 1 0
The company effectively describes the rationale for each re-used component and describes functionality and any modifications made to conform with the mission tasks.

Majority of components are new this year AND majority of components are designed and built by the company 1 0

Control and Electrical System

10 pts max

Control system is thought through and designed logically 2 1 0

Components logically and neatly incorporated 2 1 0

Computer or Manual Controllers

Note: Score one set OR if a hybrid system, score split the points - 1.5 for computer and 1.5 for manual

Computer - software code follows logical flow 1 0

- designed by students 1 0

- company has a good command of s/w flow 1 0

OR

Manual - switches laid out intuitively 1 0

- switches are clearly labeled 1 0

- students are able to manipulate switches easily 1 0

Propulsion

5 pts max

Thrusters are securely attached 1 0

Thrusters do no obstruct water flow 1 0

Thrusters are waterproofed and protected 1 0

Company describes rationale for number and layout of thrusters 2 1 0

Buoyancy and Ballast

4 pts max

Company describes how buoyancy/ballast system takes missions into account 2 1 0

Company demonstrates application and knowledge of skills in selection and usage of particular buoyancy system 2 1 0

Sensors

6 pts max

Company describes rationale for number and layout of cameras 2 1 0

Sensors demonstrate creativity and/or unique features and are appropriate to accomplishing the mission 2 1 0

Company demonstrates application of knowledge and skills in design/selection of sensors 2 1 0

Payload Tools

6 pts max

Payload tools are appropriate for accomplishing the mission 2 1 0

A single payload tool has multiple uses 2 1 0

Company describes rationale for design and how those features contribute to accomplishing the mission 2 1 0

Tether

3 pts max

Tether is securely attached to and appropriately positioned on the ROV 1 0

Tether is neatly bundled and protected and not a tripping hazard 1 0

Company developed a tether management protocol 1 0

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Budget	3 pts max
Company describes how budget was developed and adhered to (or not) during the project	1 0
Company notes where/how they obtained the funds to pay for the vehicle	1 0
Companies acknowledges organizations and/or individuals who contributed funds, equipment, and/or technical/moral support	1 0

Engineering Evaluation Score:

Discretionary Points	3 pts max
Bonus points for a job well done	3 2 1

Deductions	-13 pts max
not able to provide a valid justification why	0 -3 -5
Interference or coaching by mentors, parents, etc. during presentation (beyond helping with language barrier issues)	0 -1 -3
Overuse of commercial components without adequate justification	0 -3 -5

Engineering Evaluation Total Score:

Comments: