**Robotics and Engineering – Examine Technical Reports**

Due November 13th

Evaluate past ROV competition reports:

* Print and Read over Technical Report attached.
* Go to <http://www.marinetech.org/2014-tech-reports-international/>
* You may have to create an account to view items.
* **Pick one of the following reports to examine and evaluate using the rubric**
  + John Hancock College Prep High School
  + Homeschool - Typhoon Industries
  + The Robot Factory 4-H Club
* **Pick one of the following reports to examine and evaluate using the rubric:**
  + Clarenville High School
  + Cornerstone Academy
  + Aptos High School
* Compare and Contrast these two reports
  + What did they both do well?
  + What did you see as a major difference?
* After reading these technical reports, what areas do you feel confident you could write about?
* What areas do you think you think will be hard to write about?
* Any other thoughts?
* Be prepared to share your reflections with the class.

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| **TECHNICAL REPORT - RANGER & EXPLORER** | **MAX SCORE = 100** |
| **School name and # AS IT APPEARS ON THE OFFICIAL LIST:** |  |
| **Judge's name:** |  |
| **1 0 = Yes (1) or No (0)** |  |
| ***4 3 2 1 0 = 4: Outstanding, 3: Exceptional, 2: Excellent, 1: Good, 0:Poor or missing*** | **SCORE** |
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| **Overall Presentation** | **13 pts max** |
| Report is 25 pages or less | 1 0 |
| Measurements are in SI units (exceptions include 1/2-inch PVC, etc.) | 1 0 |
| Report is well thought out, logically organized, and concise | 3 2 1 0 |
| *Note: The report should follow a logical flow and not necessary the order presented in the specs, where budget comes before the rationale.* |  |
| Report is “professional” and well written (e.g. attention to spelling, grammar, sentence structure) | 2 1 0 |
| Includes a table of contents | 1 0 |
| Report clearly describes how the vehicle was designed to accomplish the missions | 2 1 0 |
| Report demonstrates an understanding of the technical and scientific concepts behind designing and building the vehicle | 3 2 1 0 |
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| **Title Page Contains** | **3 pts max** |
| Includes all elements as specified in the guidelines | 1 0 |
| *(Company name; school, club, or organization's name, city, and state; lists members of the company and their role; name of instructor/mentor)* |  |
| Presents a professional view of the company | 2 1 0 |
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| **Abstract** | **3 pts max** |
| Is 250 words or less | 1 0 |
| Concise and clear summary of the company's work | 2 1 0 |
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| **Photos of ROV** | **5 pts max** |
| Complete, intact photo of the vehicle is included | 1 0 |
| Includes additional photos to help fully capture the design of the ROV | 1 0 |
| Photo captions or descriptions accompany photos | 1 0 |
| A mechanical drawing or sketch is included (may be of a sub-system) | 2 1 0 |
| *Note: A mechanical drawing is defined as a scale graphical representation of the part or system to convey manufacturing information. The intent is to deem excellence if the drawing/sketch is particularly well done.* |  |
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| **Budget** | **7 pts max** |
| Math accurate | 1 0 |
| Presents a detailed accounting of funds that makes a distinction among items purchased, re-used, and donated | 3 2 1 0 |
| *Note: View this as a "snapshot" as of the date it was submitted (May 29th). Companies were encouraged to note which expenses were estimates (e.g. travel to/from the competition) as well as what expenses were anticipated but had not been realized as of this date.* |  |
| In additon to parts and materials, accounts for time and services either paid for or donated (e.g. local machine shop donates time on its equipment) | 2 1 0 |
| Includes a fair market value for donations listed | 1 0 |
| *Note: If no donations are listed, score as a 1* |  |
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| **System Integration Diagram (SID)** | **6 pts max** |
| Created using CAD | 1 0 |
| Makes a clear distinction between the surface controls and the ROV | 1 0 |
| Discloses presence of fuse/circuit breaker | 1 0 |
| Is a system-level, connection diagram (nota board or component-level schematic) | 1 0 |
| If fluid power is used, includes a fluid power SID | 1 0 |
| *Note: If fluid power is NOT used, score as a 1* |  |
| Uses ANSI, NEMA, or IEC recognized electrical, hydraulic, and/or pneumatic symbols | 1 0 |

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| **Design Rationale** | **15 pts max** |  |
| Presented in a clear and logical manner | 3 2 1 0 |  |
| Demonstrates step-by-step planning and design process | 2 1 0 |  |
| Describes how the company brainstormed ideas to solve the mission tasks and evaluated those ideas against competing alternatives | 4 3 2 1 0 |  |
| Effective (and not over-) use of images, schematics, and data to communicate their "story" | 2 1 0 |  |
| Demonstrates acquisition and application of technical skills | 2 1 0 |  |
| A flowchart describes the software flow OR rationale is provided describing why a hardware only approach was selected | 2 1 0 |  |
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| **Troubleshooting Techniques** | **4 pts max** |  |
| Explains a troubleshooting technique(s) | 2 1 0 |  |
| Describes any testing done on components or the vehicle | 2 1 0 |  |
| *Note: Two points if whole vehicle was tested; one point for component testing only* |  |  |
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| **Vehicle Systems** | **14 pts max** |  |
| Original vs. commercial design |  |  |
| *Are the majority of the components designed & built by the company?* | 4 3 2 1 0 |  |
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| *To the extent that commercial components are used, is a valid justification and technical* | 3 2 1 0 |  |
| *description provided for each commercial component?* |  |  |
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| New vs. re-used components from "last year" |  |  |
| *Are the majority of the components new this year?* | 4 3 2 1 0 |  |
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| *To the extent that components are re-used, is a valid justification and technical* | 3 2 1 0 |  |
| *description provided for each re-used component?* |  |  |
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| **Safety** | **8 pts max** |  |
| Includes a safety section | 1 0 |  |
| Describes company safety philosophy and practices during design and development of ROV | 2 1 0 |  |
| Describes specific safety features of vehicle | 2 1 0 |  |
| Describes safety precautions necessary while handling/operating the vehicle | 1 0 |  |
| Includes examples of safety incidences (from band-aids to accidents avoided) | 1 0 |  |
| Company shares a copy (preferably as an appendix) of its own safety checklist that is organized and well-thought through | 1 0 |  |
| *Note: The checklist is NOT the safety inspection checklist provided by the competition. If the competition's is used, score as a 0.* |  |  |
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| **Challenges** | **4 pts max** |  |
| Describe at least one challenge faced | 2 1 0 |  |
| *Note: Two points if both a technical and a non-technical challenge are described* |  |  |
| Method(s) used to overcome the challenge(s) | 2 1 0 |  |
| *Note: Two points if both a technical and a non-technical method are described* |  |  |
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| **Lessons Learned** | **4 pts max** |  |
| Lesson learned or skill gained relating to the process – technical | 2 1 0 |  |
| Lesson learned or skill gained relating to the process – interpersonal | 2 1 0 |  |
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| **Future Improvements** | **2 pts max** |  |
| Thoughtful and logical discussion of a least one improvement | 2 1 0 |  |
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| **Reflections** | **2 pts max** |  |
| Thoughtful personal or professional accomplishments from competition participation presented as a team or as individual team members | 2 1 0 |  |

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| **Teamwork** | **7 pts max** |  |
| Company demonstrates that the vehicle (and the report) was a company effort | 2 1 0 |  |
| Company demonstrates that its members, and not mentors or working professionals, designed and built vehicle, particularly electrical and software | 2 1 0 |  |
| Company developed specific assignments to design/build the vehicle | 1 0 |  |
| Company developed a schedule to aid in building the vehicle and describes how they kept to or strayed from it | 2 1 0 |  |
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| **References** | **1 pt max** |  |
| Lists any books, journal articles, web sites, etc. used as sources of information | 1 0 |  |
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| **Acknowledgements** | **2 pts max** |  |
| Companies, individuals who contributed funds, equipment, and/or technical/moral support are acknowledged | 1 0 |  |
| Recognizes the MATE Center and/or regional contest coordinators | 1 0 |  |
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| **TECHNICAL REPORT SCORE:** | |  |
| **Discretionary Points** | **3 pts max** |  |
| Bonus points for extraordinary work | 3 2 1 |  |
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| **Deductions** | **-13 pts max** |  |
| Company mentions that work was done by commercial companies and/or instructors or mentors and not able to provide a valid justification why | 0 -3 -5 |  |
| Overuse of commercial components without adequate justification | 0 -3 -5 |  |
| Use of appendices | -3 |  |
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| **TOTAL TECHNICAL REPORT SCORE:** | |  |
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| **Comments:** | |  |