

2018 MATE ROV COMPETITION TECHNICAL DOCUMENTATION SCORE SHEET - NAVIGATOR

JUDGE NAME:

COMPETITION CLASS: Navigator

TEAM #:

COMPANY/SCHOOL NAME: N/A

| Category | Criteria | Scoring Requirements | Enter your scores here | Raw Score | Points Possible by category | Raw % | Weight | Category Score | Comments |
|-----------------------------|--|--|------------------------|-----------|--------------------------------|-------|--------|----------------|----------|
| Overall Presentation | | | | 0 | 56 | 0% | 20% | 0.00 | |
| | Document specifications | | | | | | | | |
| | All 4 requirements met = 4 points 3 requirements met = 3 points 2 requirements met = 2 points 1 requirement met = 1 point | Document meets requirements: length no more than 10 pages, font size of at least 12 points, uses Times New Roman, Arial, or Calibri font, all measurements are in SI units (except things traditionally specified in other units, e.g. PVC diameter) | | 0 | | | | | |
| | Use same scale as above | Title page meets content requirements: company name, organization/school name and location (city, state), team members and their roles, and mentor name(s) | | 0 | | | | | |
| | | Abstract provides clear, concise summary of work in 150 words or less | | 0 | | | | | |
| | Use of images | | | | | | | | |
| | | Photo of complete vehicle is included | | 0 | | | | | |
| | | Effective use of photos and sketches to capture the vehicle's design features | | 0 | | | | | |
| | | Photos/sketches accompanied by appropriate captions | | 0 | | | | | |
| | | Sketches use sensible labeling of symbols, dimensions, and components | | 0 | | | | | |
| | Understanding | | | | | | | | |
| | | Demonstrates clear understanding of the technical and scientific concepts and their relationship to vehicle design and implementation | | 0 | | | | | |
| | | Document clearly describes the vehicle design and building process | | 0 | | | | | |
| | Document Design | | | | | | | | |
| | | Thorough attention to grammar and spelling | | 0 | | | | | |
| | | Document is thoughtfully prepared, with thorough attention paid to flow, communicating the major points, and aesthetic presentation | | 0 | | | | | |
| | | Document presents a professional view of the company | | 0 | | | | | |
| | Acknowledgements and References | | | | | | | | |
| | | Document includes a properly documented list of references - books, journals, web sites, etc. used as sources; documented contributions of companies, individuals who contributed funds, equipment, and/or technical/moral support | | 0 | | | | | |
| | | Document provides adequate acknowledgement of contributions of companies and individuals that contributed funds, equipment, and/or other support to the team | | 0 | | | | | |
| Teamwork | | | | 0 | 16 | 0% | 10% | 0.00 | |
| | Company Effort | | | | | | | | |
| | | Document clearly demonstrates that the vehicle and report were team efforts, not done by mentors or working professionals | | 0 | | | | | |

| Category | Criteria | Scoring Requirements | Enter your scores here | Raw Score | Points Possible | Raw % | Weight | Category Score | Comments |
|-------------------------|--|---|------------------------|-----------|-----------------|-----------|------------|----------------|----------|
| | Project Management | | | | | | | | |
| | | Team developed and maintained a schedule to aid in building the vehicle | | 0 | | | | | |
| | | Describes the organizational and planning processes and activities used | | 0 | | | | | |
| | | Describes how resources, procedures, and protocols were managed to meet mission objectives and solve day to day operational problems | | 0 | | | | | |
| Design Rationale | | | | 0 | 40 | 0% | 30% | 0.00 | |
| | Content | | | | | | | | |
| | | Describes a logical, step-by-step planning and design process | | 0 | | | | | |
| | | Describes how design ideas were originated, evaluated, and selected | | 0 | | | | | |
| | | The science or techniques behind the tasks is discussed | | 0 | | | | | |
| | | Provides clear description and sensible rationale for design choices related to cost and size | | 0 | | | | | |
| | Understanding | | | | | | | | |
| | | Demonstrates a detailed understanding of the science/industry mission | | 0 | | | | | |
| | | Provides clear description and sensible rationale relating designs choices and specifications to meet mission task requirements | | 0 | | | | | |
| | Build vs. buy, new vs. used | | | | | | | | |
| | Justification | | | | | | | | |
| | | Provides justifications for build vs. buy decisions | | 0 | | | | | |
| | | Provides justifications for new vs. re-used decisions | | 0 | | | | | |
| | Understanding | | | | | | | | |
| | | Demonstrated a thorough understanding of both their built and bought components | | 0 | | | | | |
| | | Demonstrated a thorough understanding of both their new and re-used components | | 0 | | | | | |
| SID | | | | 0 | 8 | 0% | 5% | 0.00 | |
| | System Integration Diagrams | | | | | | | | |
| | All 4 requirements met = 4 points 3 requirements met = 3 points 2 requirements met = 2 points 1 requirement met = 1 point | SID meets requirements: made using CAD, distinguishes between surface controls and the ROV, includes fuse and shows its location, and uses ANSI, NEMA or IEC recognized electrical, hydraulic, and/or pneumatic symbols | | 0 | | | | | |
| | | SID has appropriate level of detail: is a system level/connection diagram (not a board or component-level schematic) | | 0 | | | | | |

| Category | Criteria | Scoring Requirements | Enter your scores here | Raw Score | Points Possible | Raw % | Weight | Category Score | Comments |
|----------------------------|--|---|------------------------|-----------|------------------|---------------------|--------|----------------|------------|
| Safety | | | | 0 | 12 | 0% | 10% | 0.00 | |
| | Content | | | | | | | | |
| | | Document highlights safety features and philosophy | | 0 | | | | | |
| | | Document describes how the vehicle is designed and built to meet safety requirements | | 0 | | | | | |
| | Safety procedures | | | | | | | | |
| | | Document describes steps taken to identify and address safety concerns | | 0 | | | | | |
| Critical Analysis | | | | 0 | 28 | 0% | 10% | 0.00 | |
| | Testing and Troubleshooting | | | | | | | | |
| | | Describes how (complete) vehicle was tested | | 0 | | | | | |
| | | Describes troubleshooting strategies and techniques used | | 0 | | | | | |
| | Challenges | | | | | | | | |
| | | Describes at least one significant technical challenge encountered, and the process used to resolve it | | 0 | | | | | |
| | | Describes at least one significant interpersonal or organizational challenge encountered, and the process used to resolve it | | 0 | | | | | |
| | Lessons Learned | | | | | | | | |
| | | Describes technical lessons learned | | 0 | | | | | |
| | | Describes interpersonal or management lessons learned | | 0 | | | | | |
| | | Describes development of skills | | 0 | | | | | |
| Future Improvements | | | | 0 | 4 | 0% | 5% | 0.00 | |
| | Reflection | | | | | | | | |
| | | Provides a thoughtful and logical discussion of at least one potential improvement to design, design process, or project management | | 0 | | | | | |
| Accounting* | <i>*See supplemental info tab for more information</i> | | | 0 | 12 | 0% | 10% | 0.00 | |
| | Budget | | | | | | | | |
| | | Thorough and accurate description of budget planning and following | | 0 | | | | | |
| | | A clear distinction is made between items purchased, re-used, and donated | | 0 | | | | | |
| | | All donations (items, services, and time) are acknowledged | | 0 | | | | | |
| | | | | 0 | 176 | 100% | | 0.00 | Base Score |
| | | | | Raw Score | Max Points (cat) | Total % (check:100) | | | |

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|-----------------------------|---|----------------------|------------------------|-----------|-----------------|-------|--------|----------------|-----------------------------|
| | | | | | | | Weight | | |
| Discretionary Points | | | 0-4 pts each | 0 | 8 | | 1 | 0 | Discretionary points |
| | Document describes exceptional design of vehicle, sensors, instruments, software, tools or other features | | | 0 | | | | | |
| | Documents describes remarkable effort to design and manufacture every component of the vehicle | | | 0 | | | | | |
| Deductions | | | 0-4 pts each | 0 | 8 | | 1 | 0 | Deduction points |
| | Evidence that the work was performed by coaches, mentors, parents, or other non-team members | | | 0 | | | | | |
| | Significant overuse of commercial or reused components without adequate justification | | | 0 | | | | | |
| | | | | | | | | 0 | Final Score |
| Other Comments | | | | | | | | | |
| | | | | | | | | | |

| Scoring Rubric (applies to all score items) | Outcome | Criteria | Score |
|--|------------------------------------|---|----------|
| | Missing | Not included, can't evaluate | 0 |
| | Needs work | Effort made, meets some key requirements. Understanding or treatment of key requirements needs more depth | 1 |
| | Partially meets requirement | Response demonstrates understanding and addresses most key requirements | 2 |
| | Meets requirement | Response demonstrates thorough understanding and addresses all key requirements | 3 |
| | Exceeds requirement | Response extends beyond key requirements, demonstrating exceptional depth and breadth of understanding | 4 |

| Discretionary Points Rubric | Degree | Points |
|--|----------------------|----------|
| Criteria: - Novelty - Depth of Understanding - Depth of Analysis - Effectiveness (functions as intended) - Quality of Implementation | None | 0 |
| | Minor | 1 |
| | Fair | 2 |
| | Good | 3 |
| | Extraordinary | 4 |

| Deductions Rubric | Degree | Deduction |
|---|----------------|-----------|
| Criteria: - Extent to which team relied on outside help, existing work and/or purchased components and services | None | 0 |
| | Minor | 1 |
| | Fair | 2 |
| | Medium | 3 |
| | Extreme | 4 |



Technical Report Rubric Supplemental Information

PHOTOGRAPH OF YOUR COMPLETED ROV

In your technical documentation you must include at least one photo(s) of your completed, assembled vehicle, in addition to any photos of individual systems and/or payload. You are permitted to make modifications that may change the look of your vehicle between the time you submit your report and the competition.

NOTE: Reports will not be re-evaluated and rescored for any changes to your vehicle from the time that you submit your documentation and the competition.

SID

See the Design and Building Specifications section of the competition manual for guidance on creating your system interconnection diagram (SID).

ACCOUNTING

Budget

At the beginning of the project, companies should establish a budget.

A budget is different than a project costing sheet (see the next bullet) in that it is a projection of the cost of the project.

Companies should create categories and realistically estimate what they think that they will spend in each.

If well-thought through, the project costing will align with the budget (i.e., the amount budgeted for a certain category will be the actual amount spent!).

The budget can be included as an appendix.

Budgets typically don't provide estimates for every part, either just the overall categories or the categories and larger purchases.

How the budget is split up will be different for each company, though it is suggested that the company goes further than just a budget of parts and travel (for example, break it up into the overall components, chassis, electrical, travel, etc.)

Including items being re-used in the budget can be helpful to figure out how much the team estimates it will need to raise funds for.

Example Budget:

Budget

| | | | Reporting period | |
|---|--------------|--|----------------------------------|-----------------------|
| School Name: | | Zande High School | From: 12/1/2014 | |
| Instructor/Sponsor: | | Jill Zande | To: 5/28/2014 | |
| Income | | | | |
| <i>Income at start of project (if any)</i> | | | | |
| Source | | | | Amount |
| Zande High School Grant | | | | \$ 1,000.00 |
| | | | | |
| | | | | |
| Expenses | | | | |
| Category | Type* | Description/Examples | Projected Cost | Budgeted Value |
| Hardware | Purchased | PVC pipe, tees | \$ 2,000.00 | \$ 2,000.00 |
| Electronics | Purchased | Control boards, wire | \$ 500.00 | \$ 500.00 |
| | Re-used | Logitech Extreme 3D Pro | \$ 35.00 | \$ - |
| | Donation | 2 SeaBotix Thrusters | \$ 2,600.00 | \$ - |
| Sensors | Purchased | Lights Camera Action SS-AquaCam | \$ 1,000.00 | \$ 1,000.00 |
| Travel | Purchased | 1 round-trip airfare to St. John's | \$ 1,500.00 | \$ 1,500.00 |
| General | Purchased | Marketing material, transportation packaging | \$ 150.00 | \$ 150.00 |
| | | | | \$ - |
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| *Items must fall into one of the following: | | | | |
| Purchase - defined as items that will be purchased new or services paid for. | | | Total Income: | \$ 1,000.00 |
| Re-use - defined as items that were purchased in previous years. Amount MUST be listed as the current market value. | | | Total Expenses: | \$ 7,785.00 |
| Donation - defined as equipment, materials, and time that were contributed to your company. | | | Total Expenses-Re-use/Donations: | \$ 5,150.00 |
| | | | Total Fundraising Needed: | \$ (4,150.00) |

Project costing

Project costing is an accounting of your income, donations, and expenditures.

Items must be listed as one of the following: purchased, re-used, parts donated, or cash donated.

For re-used or donated items, report the item's current market value and note the source or organization that made the donation.

Example Project Costing:

| PROJECT COSTING | | | | | | Reporting period | | |
|---|-----------|---------------|-------------------|----------|------------------------------------|---------------------------------------|---------------|-----------------|
| School Name: | | | Zande High School | | | From: 12/1/2014 | | |
| Instructor/Sponsor: | | | Jill Zande | | | To: 5/28/2014 | | |
| Funds | Date | Type* | Category | Expense | Description | Sources/Notes | Amount | Running Balance |
| | 12/1/2014 | Purchased | Hardware | PVC | PVC pipe, tees | Used for vehicle frame | \$ (200.00) | \$ (200.00) |
| | 12/5/2014 | Re-used | Electronics | Joystick | Logitech Extreme 3D Pro | Used for control system | \$ (35.00) | \$ (235.00) |
| | 1/10/2015 | Parts donated | Sensors | Camera | Lights Camera Action SS-AquaCam | Won at a previous competition | \$ (600.00) | \$ (835.00) |
| | 1/31/2015 | Purchased | Travel | Airfare | 1 round-trip airfare to St. John's | Chaperone's ticket | \$ (900.00) | \$ (1,735.00) |
| | 2/2/2015 | Cash donated | General | | Funds donated by local Rotary Club | Used for general vehicle construction | \$ 500.00 | \$ (1,235.00) |
| | | | | | | | | \$ - |
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| *Items must fall into one of the following: | | | | | | | | |
| Purchased - defined as items that are purchased new or services paid for. | | | | | | | Total Raised | \$ 500.00 |
| Re-used - defined as items that were purchased in previous years. Amount MUST be listed as the current market value. | | | | | | | Total Spent | \$ (1,735.00) |
| Parts donated - defined as equipment, materials, and time that were contributed to your company. Do NOT include items given to your school for general use. | | | | | | | Final Balance | \$ (1,235.00) |
| Cash donated - defined as funds contributed to your company. Do NOT include funds given to your school for general use. | | | | | | | | |