



## JUDGE INSTRUCTIONS: 2017 STATE ENGINEERING DESIGN CHALLENGE

### EVENT SCHEDULE (APPROXIMATE AND SUBJECT TO CHANGE)

- 11:30 am Judges training (Lunch will be provided)
- 12:15 pm Students move into the auditorium for instructions.
- 12:35 pm Teams move to the design and construction area. They may not read instructions or touch supplies until instructed to do so.
- 1:35 pm Judging begins. **NO ADDITIONAL WORK OR TESTING CAN BE DONE AFTER TIME IS CALLED.** Please help us watch to make sure all teams stop working on their project at this time.

### CHALLENGE OVERVIEW

You will work with another judge to review the work of at least 5 Engineering Design Challenge teams. The students on these teams do not know each other, and have just been assigned to their team. They have been asked to use the limited set of materials to design and build the blades of a wind turbine. They will connect the blades to a generator and record the electric current generated at low, medium and high speeds. Students must explain their design decisions, choice of materials and why their design is superior. You will also be scoring the teams on teamwork and presentation skills.

### TRAINING AGENDA

- Review regulations (page 2 student instructions), judging area and score sheet.
- Demonstration of judging
- Break into judging teams and distribute supplies (clipboards, pens, extra forms)
- Assign judging areas

### RESPONSIBILITIES DURING THE DESIGN AND BUILD PHASES

Your primary responsibilities are to make sure that the teams in your area:

- Have all listed supplies
- Follow verbal and written instructions:
  - Make sure the teams start and stop on time
  - Make sure the teams only use supplies listed in the instructions and provided by TAME
  - Make sure there is no assistance given by anybody outside of the team
- Have a legible, complete Project Documentation Form

Share your enthusiasm for the students' creativity but give **no** advice on the design or construction of the project!



## RESPONSIBILITIES DURING THE EVALUATION PHASE

You will work with another judge to review and evaluate work completed by student teams. Ask questions, celebrate creative ideas and provide positive feedback!

First, introduce yourself to the teams in your assigned area. Then, for each team:

1. Collect the Project Documentation form and the score sheet. Keep all forms stapled together.
2. Verify that the turbine has a name, that the teams have tested their wind turbine at least once, and that they have returned unused materials.
3. Ask the Sales Engineer to explain why they used the materials that they did, what design considerations led them to this decision and how their wind turbine is superior.
4. With the fan off, ask the Test Engineer to connect the turbine to the generator. Verify that the multi-meter is connected, and set to the 'microamps' setting.
5. Turn the fan on at LOW speed and set a timer for 20 seconds. The Test engineer may gently push the blades once to get the turbine spinning during this time.
6. At 20 seconds, press the 'hold' button on the multimeter and record the electric current being produced. Reset the timer to 20 seconds, toggle the 'hold' on the multimeter and record the reading again. Repeat after another 20 seconds.
7. Turn fan speed to MEDIUM and repeat the process, taking 3 readings on the multimeter.
8. Turn the fan speed to HIGH and repeat the process, taking 3 readings on the multimeter.
9. If the blades fall off or the turbine stops rotating, the testing is stopped. Record the issue and do not enter any additional scores on the scoring sheet.
10. Make sure that you have both the Project Documentation Form and Scoring Sheet for the project. Make sure that both forms have the correct team number on them.
11. Any violation of the rules, including use of improper materials, is an automatic disqualification. Please write "Disqualified" on the bottom of the score sheet and notify your lead judge if this occurs.

Congratulate the team on a job well done and release them to the next activity on the agenda.

## RESPONSIBILITIES AFTER ALL PROJECTS HAVE BEEN TESTED

Turn in your Scoring Sheets and Project Documentation forms to **the lead judge or a designated TAME intern/volunteer in a teal competition t-shirt**. They will collate the data and identify the winners.

Please complete an evaluation form for our event and submit it with the scoring sheets. We truly value your input.

**Thank you for volunteering. Your time and effort are truly appreciated!**