NRL TECHNICAL AND COMPETITION RULES AND REGULATIONS UPDATES

TECHNICAL REGULATIONS

1.5.9 Currently Reads

Safety offenses will be handled as follows:

1) The first safety offense from any member of the team will result in a warning.
2) The second offense from any member of that same team will result in a 10 second controller impoundment at the beginning of your next match. This means your opponent will be able to attack your immobile robot.
3) Violations stack so if a team has 3 infractions between matches the impoundment period would be 20 seconds.
4) After the penalty is assessed, the team starts over meaning the next offence results in a 10 second impoundment during the next match. No additional warnings will be given.

1.5.9 Updated Will Read

Safety offenses will be handled as follows:

1) The first safety offense from any member of the team will result in a warning.
2) The second offense from any member of that same team will result in a 10 second controller impoundment at the beginning of your next match. This means your opponent will be able to attack your immobile robot.
3) Violations stack so if a team has 3 infractions between matches the impoundment period would be 20 seconds.
4) After the penalty is assessed, the team starts over meaning the next offence results in a 10 second impoundment during the next match. No additional warnings will be given.
5) The NRL Event Coordinator has the right to disqualify a team member or team due to safety offenses.

4.2 Currently Reads

The NRL recommends using the Spektrum Transmitter DX6, due to the corresponding receivers having SmartFail Technology. If a team is utilizing a different transmitter system for the competition, the system must meet the fail-safe protection requirements.

4.2 Updated Will Read

The NRL requires teams to use a 2.4 GHz or greater radio system equipped with a functional fail-safe feature. This feature must immediately disable all motion and weapon systems upon signal loss or transmitter shutdown. Systems with technology such as Spektrum's SmartFail—or equivalent—are acceptable.

4.3 Currently Reads

Bluetooth systems must be approved by the NRL safety committee prior to the competition. Operating plans, schematics, and a clear explanation of controls must be presented for review. The NRL should get this information at least one week before the competition so that the safety committee can verify it at the start of competition. The Bot must comply with all other regulations, meaning the Bot should be in zero energy state when not in the test box or arena (cage). All power must be off and dissipated. The students should not need to handle the Bot in order to bring the robot to a zero energy state. The battery must be disengaged by the master switch and any energy storing devices must automatically drain when the master switch is shut off. The energy storing should only take place when the Bot is on. Any capacitors or electrical storage devices used in the system must be capable of being safely discharged without putting the students at risk.

4.3 Has Been Deleted

6.2 Currently Reads

All nominal onboard maximum voltages are limited to: 28 Volts for 15# class robots for this league. (It is understood that a charged battery's initial voltage state is above their nominal rated value.)

6.2 Updated Will Read

All nominal onboard maximum voltages are limited to: 24 Volts for 15# class robots for this league. (It is understood that a charged battery's initial voltage state is above their nominal rated value.)

6.7 and 6.8 Have Been Added

6.7. Primary-Power batteries and any power handling electrolytic-type capacitors has to be securely mounted and located so that they are enclosed within the structural frame of the Bot. The battery pack (or packs) shall be securely mounted to a substantial part of the Bot using a mechanical means.

Tape and duct tape are not approved to secure a battery.

6.8. All battery cells and packs not in use must be stored in a fireproof storage bag or container, such as a LiPo-safe battery charging bag.

10.0 Rotational weapons or full body spinning robots:

Section 10.6 Tip Speed has been modified to the below (revised from “per second” to “per hour0”

10.3 Rotational weapons must not exceed a tip speed of 250 miles per hour (mph). Teams must provide weapon RPM and diameter at inspection to verify compliance. Bots found to exceed this limit will not be permitted to compete until the issue is corrected.

$$\text{Tip Speed (mph)} = (\pi \times \text{Diameter (in inches)} \times \text{RPM}) / 1056$$

10.3 Has Been Added

10.3 Rotational weapons must not exceed a tip speed of 250 feet per second. Teams must provide weapon RPM and diameter at inspection to verify compliance. Bots found to exceed this limit will not be permitted to compete until the issue is corrected.

Tip speed can be calculated using the following formula:

$$\text{Tip Speed (ft/s)} = (\pi \times \text{Diameter} \times \text{RPM}) / 720$$

COMPETITION RULES AND REGULATIONS

1.3 Currently Reads

1.3 YEARLY NRL COMPETITIONS

Regional Competitions are managed by local NTMA chapters and affiliated organizations. The dates, times and locations of the Regional Competitions are decided by the individual local organizing entities and are posted on the NRL website. The National Competition will be held annually during the 3rd weekend of May. The NTMA-WD Board of Directors and NTMA Staff will determine competition dates and location.

1.3 Updated Will Read

1.3 NRL COMPETITIONS

Regional Competitions are managed by local NTMA chapters and affiliated organizations. The dates, times and locations of the Regional Competitions are decided by the individual local organizing entities and are posted on the NRL website. The NTMA-WD Board of Directors and NTMA Staff will determine competition dates and location.

1.4 Currently Reads

1.4 CONTACTING NRL

For questions, comments, requests, and clarifications regarding the competition rules, technical regulations, and procedures in any NRL document, contact the NTMA Staff.

Bill Padnos Director of Youth Engagement | National Tooling and Machining Association

1357 Rockside Road, Cleveland, OH 44134

Direct Tel: 216/264-2828 | Email: bpadnos@ntma.org | Website: www.goNRL.org.

1.4 Updated Will Read

For questions, comments, requests, and clarifications regarding the competition rules, technical regulations, and procedures in any NRL document, contact the NTMA Staff.

Jennifer Stupica

Director of Workforce Development | National Tooling and Machining Association

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www.ntma.org

(216) 533-6807

2.3 Paragraph 5 Currently Reads

It is assumed that the students do the majority of the work on the Bot with adult supervision when necessary. Non students, including advisors, coaches, and parents, may not work on the Bot unless they get approval from the Event Organizer, or if intervening to prevent an imminent safety violation. Inadvertently touching the Bot while giving instruction, or holding the Bot while a student works does not count as working on the Bot. All teams are expected to be responsible, safe, follow NRL rules, and be respectful. Fighting, unruly behavior, and disrespectful behaviors will result in immediate expulsion from the competition.

2.3 Paragraph 5 Updated Will Read

The NRL competition is an educational event designed to promote student learning. As such, it is expected that students do the majority of the work on the Bot, with adult supervision and guidance provided only when necessary. Non students—including advisors, coaches, mentors, and parents—may not directly build, repair, or modify the Bot. Incidental contact, such as holding the Bot while a student works or demonstrating a task without performing it, is permitted.

Teams found violating this rule—where non-students perform significant work on the Bot—may be subject to progressive penalties at the discretion of the Event Organizer, up to and including disqualification from the competition.

All teams are expected to behave responsibly and respectfully. Fighting, unruly behavior, and disrespectful conduct will result in immediate expulsion from the event.

2.4 Bot Eligibility Currently Reads

The NRL highly encourages teams to design and build new Bots for each competition season. Any team wishing to re enter a past Bot will required to submit a description of design improvements or changes that have made other the previous year in order to be eligible to compete. A Bot that wins the First Place Award twice is automatically retired.

Changes should include making new components of some nature for the Bot. Scope of changes required for re-entry of an existing Bot include the redesign and fabrication of at least one (Drive train components, Chassis design, Weapon design or Weapon drive system).

2.4 Bot Eligibility Will Read

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Teams are not permitted to bring fully assembled or competition-ready spare Bots, including Bots from prior seasons. Spare Bots may not be used as substitutes or backups. Only approved, documented Bots may be entered and used in competition. Spare parts for field-repair purposes (e.g., motors, drive wheels, armor panels) are permitted and encouraged.

2.6 Insurance Currently Reads

All events will have basic accident insurance coverage. Teams are advised to have their own coverage when not at an event.

2.6 Insurance Updated Will Read

The Event Organizer will maintain general liability insurance coverage for NRL events; however, this coverage is not intended to serve as primary insurance for participating individuals or teams.

Each team is required to carry its own general liability insurance through its school, career and technical center, or sponsoring organization. A valid Certificate of Insurance (COI) naming the event organizer or host as an additional insured may be required prior to participation, depending on event venue or state requirements.

Minimum coverage limits include:

- General Liability – Each Occurrence: $1,000,000
- Damage to Premises Rented to You: $300,000
- Medical Expenses (Any One Person): $10,000
- Personal & Advertising Injury: $1,000,000
- General Aggregate: $2,000,000
- Participant Legal Liability: $1,000,000

Participants should coordinate with their school administrators or business office to obtain the appropriate documentation. The Event Organizer will notify teams in advance if a COI is required.

6.0 Radio Control Currently Reads

6.1 RADIO CONTROLLERS The NRL recommends using the Spektrum Transmitter DX6, due to the corresponding receivers having SmartFail Technology. If a team is utilizing a different transmitter system for the competition, the system must meet the fail-safe protection requirements.

6.2 BLUETOOTH CONTROLLERS Bluetooth systems must be approved by the NRL safety committee prior to the competition. Operating plans, schematics and a clear explanation of the controls must be presented for review.

NRL should receive this information at least one week before the competition so that we can verify it at the start of competition. The Bot must comply with all other regulations, meaning the Bot should be in zero energy state when not in the test box or arena. All power must be off and dissipated. The student should not need to handle the Bot in order to bring the Bot to a zero energy state. The battery must be disengaged by the master switch and any energy storing devices must be automatically drain when the master switch is shut off. The energy storing should only take place when the Bot is on.

Any capacitors or electrical storage devices used in the system must be capable of being safely discharged without putting the students at risk.

6.0 HAS BEEN DELETED

8.0 Rules Enforcement

Section 8.5 Sabotage has been added

8.5 SABOTAGE “Sabotage” is defined as the deliberate tampering with a Bot without the specific authorization of that Bot’s Team. If any Team member is determined to have engaged in Sabotage, that person will be expelled.

Removed from Glossary of Terms

Spread Spectrum –We strongly recommend using the Spektrum DX6 or DX7 controller with the BR6000 receiver. Newer receivers with a built-in failsafe are also allowed.