Race Rules

v10

Produced By

Energy Systems Network


http://www.IndyAutonomousChallenge.com/
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BY PARTICIPATING IN INDIY AUTONOMOUS CHALLENGE EVENTS, EACH PARTICIPANT AGREES TO THESE TERMS AND CONDITIONS AND RACE RULES (“RACE RULES”), WHICH ARE AN AGREEMENT BETWEEN THE PARTIES, SO READ THEM CAREFULLY BEFORE ENTERING. WITHOUT LIMITATION, THIS AGREEMENT INCLUDES OBLIGATIONS ON THE PART OF TEAMS AND TEAM MEMBERS AND, EXCEPT IF PROHIBITED BY LAW OR PREEEXISTING POLICY, CERTAIN INDEMNITIES TO FROM THE PARTICIPANT AND SOME LIMITATIONS OF PARTICIPANT’S RIGHTS AND REMEDIES.

1. Overview

The Race Rules (“Race Rules”) govern the Indy Autonomous Challenge (“IAC”) activities that involve IAC Teams’ (“Teams”) operations of IAC Official Vehicles (“Vehicles”) at the Indianapolis Motor Speedway (“IMS”), including but not limited to Practice Days, Final Race Qualifications, and the Final Race (“Events”). These Race Rules build upon, are in accordance with, and in no way modify the IAC Rules (see: https://www.indyautonomouschallenge.com/the-rules).

If the Race Rules do not expressly permit a variation, then the Team shall presume that such variation is not permitted. If a Team is uncertain if an act and/or part violates a Race Rule, the burden is on the Team to receive pre-approval in writing from Energy Systems Network (“ESN”), IMS, and/or their designees (the “Organizers”). Each Team assumes the risk of noncompliance. It is not necessary for a competitive advantage to be gained to constitute a violation of these Rules.

Organizers reserve the right to create and/or revise the Race Rules at any time, including, without limitation, prior to or during an Event. Notices, bulletins, supplementary Race Rules, regulations, and penalties are effective on the date and time issued, regardless of the date and time when a Team receives actual notice.

Organizers have the right to enforce the Rules, including the rights to impose and/or remove penalties for any violation of the Rules and may penalize any Team and/or exclude any Team or equipment from any Event if they deem any act, any omission, any condition to be hazardous and/or not meeting the specifications, requirements, spirit, illustrations, and/or intent of, the Race Rules.

2. Officiating

Organizers will (i) secure necessary timing and scoring and technical equipment; (ii) and record all timing and scoring information and technical information, including the standings of an Event; (iii) control the designated timing and scoring and technical areas; (iv) distribute competition
information; (v) and facilitate the award distributions. Organizers shall be the final authority on the content of all official postings.

Organizers may without limitation order the completion, postponement, or cancellation of any Event or any portion thereof for any reason. Organizers may terminate an Event before its scheduled number of laps or allotted time, including after one or more Teams have finished. Organizers may increase or reduce the scheduled number of laps or allotted time, and/or may declare an Event completed, postponed, terminated or abandoned.

3. Track Procedures, Risk and Regulations

Every Team must agree to participant consent, location release, facility use, and/or related form(s) before participating in the Events. Forms will be provided to Teams in advance of activities.

Teams must not use or be under the influence of illegal or prohibited drugs and certain prescriptions and over-the-counter medications during an Event. Organizers may disqualify or otherwise penalize any Team or Team Member for failure to promptly cooperate with any request for examination/testing and/or notification by Organizers and for any pending violation of a substance abuse policy. Anybody who shows visible signs of exhaustion, physical or psychological impairment, or other physical or psychological irregularities may be disqualified and/or excluded from an Event and subjected to additional penalties.

Organizers may penalize any Team for any violation of the Race Rules. If an Organizer observes or is made aware of an act or omission by a Team that constitutes a violation of the Race Rules, the Organizer shall conduct whatever additional inquiry it deems appropriate under the circumstances. After concluding the inquiry, the Organizer shall determine whether disciplinary action is appropriate and if so, what disciplinary action should be taken. The Team shall be informed of the determination and if disciplinary action is imposed. The Organizer shall issue a penalty notice to the Team specifying the violation, a brief statement of the circumstances of the violation and the penalty imposed. If the act or omission of a Team is determined by the Organizers to constitute a threat to the integrity or safety of the IAC or to the orderly conduct of an Event or to constitute a violation during an Event, Organizers may take immediate action against the Team.

4. Communication

During the race, Teams will not be allowed to communicate with their Vehicle in any way. Teams will be provided with telemetry and possibly other Race related information. Teams can intervene in the operations of their vehicle only through Race Control, by requesting that their vehicle be issued a Black or Purple Vehicle Signal, as defined in Section 5. Accordingly, it is
the Teams’ responsibilities to program their Vehicles to behave in ways prescribed in these Race Rules when encountering on-track conditions and scenarios.

To keep each Vehicle informed of the Race situation, Race Control will send it information about all the other Vehicles on the track, including their race position (e.g., P1, P2), time interval to the P1 Vehicle, and any active vehicle-specific signals (i.e., Black, Purple or Checkered).

5. On-Track Conditions

Organizers determine the Track Condition, which is transmitted to all Vehicles over the Race Control radio link and supplied to the Competition Team Computer. Track Conditions include the following:

- Green Track Condition signifies the track is open for practice, qualifying or racing.
- Yellow Track Condition signifies caution.
- Red Track Condition signifies a suspended practice or qualifying session, or race.
- Orange Track Condition signifies that the Vehicles should get ready to (re)start.

In addition, Race Control can transmit specific Instruction Signals to an individual Vehicle:

- Black Vehicle Signal signifies a requirement to pit.
- Checkered Vehicle Signal signifies the end of the race.
- Purple Vehicle Signal signifies the initiation of Vehicle ShutOff.

Track Conditions and Vehicle Instruction Signals need to be acknowledged by the software on the Competition Team Computer by updating its Vehicle Status, which is automatically communicated back to Race Control. Acknowledgment of on-Track Conditions is subject to a time-out of 1 second. Failure to acknowledge will lead to a Black Vehicle Signal for the corresponding Vehicle. Failure to adhere to a Black Vehicle Signal will lead to a Red Track Condition and disqualification of the Team.

After acknowledging the Track Condition, a vehicle must adhere to the corresponding behavior restrictions as soon as safely possible. If a vehicle acknowledges a Track Condition but fails to adhere to the corresponding behavior requirements as stated in this document, the Organizers shall determine whether action is appropriate and if so, what action should be taken. Possible actions can include time penalties or a Black Vehicle Signal possibly followed by disqualification.

**Green Track Condition**

The Green Track Condition signifies the track is open for practice, qualifying or racing. The competition teams are expected to account for any scenario where emergency braking or
maneuvering might be required during regular race conditions, for instance due to close maneuvering in competitive maneuvers.

As soon as Race Control issues Green Track Conditions, all other restrictions are lifted (e.g., as apply under Yellow Track Conditions) and regular race conditions take effect simultaneously for all Vehicles regardless of where each Vehicle is on the track.

Yellow Track Condition

The Yellow Track Condition signifies caution. All Vehicles must reduce speed, proceed with caution, maintain position, and pack up the field.

Under Yellow Track Condition, the Vehicles shall obey the following behavior restrictions:

- Vehicles shall decelerate safely and then maintain a speed between 80 and 120 km/h.
- Vehicles shall not overtake, except when the vehicle being overtaken is black-flagged, or for safety reasons (for instance, when a Yellow Track Condition is issued as a vehicle exits pit lane at a velocity significantly slower than an on-track vehicle coming up from behind, or when a vehicle is in the middle of an overtaking maneuver and it is unsafe to abort the maneuver). If a Vehicle improperly improves its position during Yellow Track Condition, it will be penalized.
- The Vehicle in P1 shall maintain a speed between 80 and 90 km/h and maintain a distance to the Safety Car (if deployed) between 50 and 70 m.
- Other Vehicles shall form a single file line and pack up behind the P1 Vehicle as soon as safely possible. Once packed up, Vehicles shall maintain a distance to the vehicle ahead between 30 and 50 m.
- Vehicles shall communicate to Race Control when they have achieved the Yellow Track Condition speed and distance requirements.

Red Track Condition

The Red Track Condition signifies a suspension of on-Track activities via a coordinated emergency stop. Race Control will issue Red Track Condition when the track is deemed unsafe and the risk for collision is high. Red Track Conditions are also issued before the beginning of the Race when Team Members may be tending to a Vehicle. At that time, all Vehicles must remain in the ShutOff state (engine off, brakes on, transmission in neutral) to avoid unsafe conditions. Finally, Red Track Conditions should be considered the default condition, which are in effect if the communication heartbeat with Race Control is lost.

If there is a need to suspend the race when there are no serious safety risks, Race Control will instead issue a Yellow Track Condition combined with a Black Vehicle Signal for all vehicles.
either scenario, Race Control will decide when or whether the race will restart once all Vehicles have come to a safe stop.

Under Red Track Condition, the Vehicles shall obey the following behavior restrictions:

- Vehicles shall decelerate safely and come to a coordinated full stop. The target deceleration rate is 8 m/s².
- During deceleration, Vehicles remain responsible for vehicle navigation and control, and shall be prepared to navigate around obstacles if possible.
- Vehicles shall come to a stop on the inside of the track to allow other vehicles to pass on the right if needed.
- Once stopped, Vehicles shall transition to the ShutOff state.
- Vehicles shall communicate to Race Control when they have achieved the ShutOff state.

Orange Track Condition

The Orange Track Condition signifies that the Vehicles should get ready to (re)start the Practice or Qualifying session or Race. The Vehicle should start their engines and perform any final system checks.

Race Control will issue the Orange Track Condition only after it has been determined that all Members of all Teams have moved to safety behind the Pit wall.

Under Orange Track Condition, the Vehicles shall obey the following behavior restrictions:

- Vehicles shall transition to the Ready state (engine on, brakes on, transmission in neutral) no later than 1 minute after the Orange Track Condition has been initiated. If a vehicle does not reach the Ready state within one minute, it will be penalized by being issued a Black Vehicle Signal which will remain in effect until all other Vehicles have left the Pit area.
- Vehicles shall communicate to Race Control when they have achieved the Ready state.

Black Vehicle Signal

Black Vehicle Signal signifies a requirement to pit or stay in the Pit. Race Control can issue a Black Vehicle Signal to any individual Vehicle or to all Vehicles simultaneously. When signaled, the corresponding Vehicle shall proceed to its Pit Box at the first opportunity it is safe to do so. Once the vehicle comes to a halt in its Pit Box, it must transition to the Ready state (engine on, brakes on, transmission in neutral) and remain stationary until it receives further signals from Race Control, or the Black Vehicle Signal is lifted.
When a Vehicle is ordered to its Pit Box because of a hazardous condition of the Vehicle, the proper repairs must be made and approved by Organizers before the Vehicle will be permitted to continue in the Event. In the event of a violation of the Rules, the Black Vehicle Signal may be declared to impose a penalty. The penalized Vehicle shall proceed to the Pit Lane as directed and may return to competition only once the penalty has been served and Race Control lifts the Black Vehicle Signal.

Under Black Vehicle Signal, the Vehicles shall obey the following behavior restrictions:

- Vehicles shall enter Pit Lane at the first opportunity it is safe to do so. If the signal is received right before the Vehicle reaches Pit Entrance, the Vehicle may delay Pit entry by one lap to avoid unsafe vehicle conditions.
- Upon entering Pit Lane, Vehicles shall respect Pit Lane speed limits and come to halt in their Teams’ Pit Box.
- Vehicles shall transition to the Ready state once they come to a complete stop in their Pit Box.
- Vehicles shall communicate to Race Control when they have transitioned to the Ready state and remain in the Ready state until Race Control signals otherwise.

**Checkered Vehicle Signal**

The Checkered Vehicle Signal indicates that the Vehicle completes its Practice session, Qualifying session or Race when it crosses the Start/Finish Line next.

Race Control will send a Checkered Vehicle Signal shortly before a Vehicle reaches the Start/Finish Line and is about to complete the Race. The P1 Vehicle completes its race when it crosses the Start/Finish Line. All other Vehicles complete the Race when they cross the Start/Finish Line after the P1 Vehicle completes it Race.

Under Checkered Vehicle Signal, the Vehicles shall obey the following behavior restrictions:

- Vehicles shall continue driving under current Track Condition until they reach the finish line.
- Once Vehicles cross the finish line, their Race ends even if they have not yet completed the prescribed race distance.
- Once Vehicles cross the finish line, Vehicles shall obey the behavior corresponding to Yellow Track Condition and Black Vehicle Signal, that is, they shall proceed with caution and return to their Pit Box as soon as safely possible.
Purple Vehicle Signal

The Purple Vehicle Signal signifies the initiation of Vehicle ShutOff. This ShutOff will be initiated without further intervention of the software on the Competition Team Computer. ShutOff will shut off the Vehicle’s engine, lock its steering and apply the brakes. Race Control will most commonly issue a Purple Vehicle Signal to make it safe for Team Members to approach the Vehicle when it is stationary in its Pit Box. But it is also possible for Race Control to issue a Purple Vehicle Signal while the vehicle is moving in case the Vehicle does not respond appropriately to issued Track Condition or Vehicle Signals. Teams can also request that Race Control issue a Purple Vehicle Signal to their vehicle in case of emergency.

Under Purple Vehicle Signal, the vehicle will automatically initiate Vehicle ShutOff without the need or opportunity for intervention by the Competition Team Computer.

6. Start, Restart and Finish Procedures

To start or restart an Event (i.e., Practice session, Qualifying session or the Race), Race Control will transition through a sequence of Track Conditions, starting from Red through Orange and Yellow to Green. This sequence and the corresponding Vehicle behavior are explained in further detail below.

- Before the start of the Event, the Vehicles will be positioned manually on Pit Lane in a single file line according to the order determined by the Organizers.
- Race Control will issue Red Track Conditions signaling to the vehicles that they shall remain in ShutOff condition.
- At this time, Team Members may still tend to the Vehicles, for instance, to perform any last-minute software tasks and tests, or warm the tires.
- Ten minutes before the start of the warm-up laps, Race Control will announce to the Team Members that they have five minutes left to complete their work, turn on the EnableEngine switch, and move behind the Pit wall. From this time forward, Teams can no longer issue commands to their vehicle or interact with it physically in any way. If a Team does not complete their work within the five-minute timespan, their Vehicle may be moved to the back of the lineup and depart Pit Lane after the others.
- Five minutes before the start of the warm-up laps, Race Control will issue Orange Track Condition, signifying that the vehicles should start their engines and perform any final system checks, before signaling the Ready state to Race Control.
- Five minutes later, and once Race Control has confirmed that all vehicles are in the Ready State, Race Control will issue Yellow Track Condition, signifying that the vehicles are allowed to exit the Pit and merge onto the Track.
- For Qualifying and Race Events, there will be two warm-up laps.
- For some Events, a Safety Car may be deployed to set the pace. The pace shall be around 85 km/h. In the absence of a Safety Car, the P1 Vehicle will set the pace as
specified in the Yellow Track behavior restrictions. No later than one lap before the start of the Race, the Safety Car peels off.

- When the P1 Vehicle is approximately 1 km from the Start/Finish Line, Race Control will issue Green Track Conditions, signifying the start of the Race.
- Timing will start when each Vehicle crosses the Start/Finish Line under Green Track Conditions.

When restarting the Race after a suspension (Red Track Conditions), the same process will be followed, except that the vehicles will be (manually) lined up on Pit Lane according to the physical sequence of the Vehicles at the declaration of the preceding Red Track Condition. Teams cannot adjust the Vehicle software while the Red Track Condition is enabled, but Organizers may repair the Vehicles physical or mechanical conditions, within reason and at their discretion.

At the end of any Event, Vehicles will be issued Black Vehicle Signals to alert them to return to their Pit Boxes. Once they come to a halt, a Purple Vehicle Signal will be issued to initiate transition to a safe ShutOff state. When all vehicles are in ShutOff, Team Member can push their vehicle behind the Pit wall for maintenance or service.

7. Timing and Scoring

Organizers record the physical order in which Vehicles cross each timeline, including the Start/Finish Line. The electronic system is the primary record. The scoring of Teams shall begin at the moment when the timing transponder of each Vehicle reaches the starting line.

A Vehicle is credited with a lap when its timing transponder crosses the Start/Finish Line after completing one (1) entire lap of the Track under a Green Condition. If the transponder is not functioning, Organizers will use best efforts to score the Vehicle.

On the last lap of a Race, a Vehicle will be officially credited with a lap when any part of the Vehicle under its own power crosses the finish line. Final standings will be determined by the sequence in which the Vehicles completed the scheduled number of Green Track Condition laps within the allocated time. The Race will be completed by each other Vehicle when the timing transponder of each Vehicle crosses the Start/Finish Line after the race leader. Scoring will thereafter cease and the race is completed.

In the event Organizers are unable to conclusively determine any difference in the physical sequence for two or more Vehicles at the end of the race, Organizers can declare a tie. The Organizers' decisions are not subject to review and/or appeal.

At least two (2) wheels of a Vehicle must remain on the Racing Surface, bounded on the right by the wall and on the left by the inside track line. A Vehicle will not be permitted to advance its position relative to other Vehicles due to an excursion off the Racing Surface. Vehicles shortcutting the course will have the shortcut lap time invalidated.
8. Pit Locations, Selections, and Procedures

Pit locations for race and practice weekends are assigned by the Organizers.

All Vehicles must be centered in their assigned Pit Boxes. The Vehicle must be parallel to the Pit wall.

A Pit Lane Speed Limit of 35 mph will be enforced within the Pit Lane areas defined by painted lines, cones and/or other visible markings.

At no point shall Team Members be permitted over the wall and onto the Pit portion of the Track when any of the participating Vehicle’s engines are running and/or an Event is in progress.

9. Vehicles

The competition Vehicle is a Dallara Automobili manufactured IL-15 Vehicle that has been modified by those designated and approved by ESN to enable automation. Modification includes the integration of an automated vehicle hardware and sensor package, drive-by-wire capabilities, and other capabilities and technologies to enable sufficient Event performance.

All Teams are required to use the Vehicle. Organizers will reasonably attempt to ensure all Vehicles are identical; Teams’ modifications are generally not permitted. Any modifications to the Vehicle chassis, body, powertrain, transmission, wheels, tires, hardware, sensors, or any of its other physical characteristics require ESN’s and/or its designees’ written permission and will likely be granted only in extraordinary circumstances. These modifications include any alterations of the Vehicle’s setup including but not limited to tire pressures, suspension setup, and aerodynamic configuration. Vehicles will be mechanically and physically certified in advance of all track times, and unapproved modification(s) and/or those that are not made public by the Teams are grounds for disqualification. Additionally, Teams may have their Vehicles branded with their respective university, sponsor, and related logos upon ESN’s written approval. In such cases, Teams will be directed to follow specific branding procedures and protocols that will be provided by the Organizers. Teams may not modify or obstruct any preexisting branding on the Vehicle at the time of receipt.

Vehicles may come with programming and/or other elements to ensure aspect(s) of safety and safe operations – such as the capacity for the Organizers to remotely disable the Vehicles (the Purple Vehicle Signal, aka, Kill Switch) – in which case Teams will be informed of the details of such programming and shall not modify such programming. The Teams are not permitted to tamper with or modify any software installations other than the software deployed on the Team Competition Computer.
Organizers will store Vehicles and facilitate IMS track time in advance of the Final Race for Teams to test their Vehicles. During official IAC track activities at IMS, Vehicles will be mechanically maintained and serviced by (a) Vehicle Support Team(s) provided by ESN. Organizers will reasonably attempt to ensure all Vehicles’ mechanical maintenance and servicing are to identical standards; Teams’ are generally not permitted to mechanically maintain or service their Vehicle during official IAC track activities at IMS.

10. Final Race Qualifications and Starting Positions

Final Race Qualifications determine the eligibility and starting position of each Vehicle desiring to participate in the Final Race by ranking the Vehicle on the basis of its performance in Qualifications.

Organizers shall determine the starting time for the Qualifications period and may adjust the length of the session as necessary.

The beginning of Final Race Qualifications will consist of a static technical and safety inspection of all Vehicles at IMS to ensure compliance with all rules, to verify the details of Vehicle operation in accordance with all ESN instructions, and to ensure safe Vehicle operation. Any deviations will be identified to the Team Leader for immediate action to bring the Vehicle into compliance – defined by adhering to the terms established in “Section 9. Vehicles”. If a Vehicle cannot be brought into compliance within the timeframe set forth by ESN and to ESN’s satisfaction it may be disqualified.

Vehicles must be in the Qualifications line at the designated time to be guaranteed an attempt. A Team reserves its position in line as long as it remains in position, is moved as the line progresses and proceeds with the Qualifications attempt when signaled. A Vehicle must not leave the Qualifications line without the approval of Organizers.

During Qualification, Vehicle shall follow the Start and Finish procedures as defined in “Section 6. Start, Restart and Finish Procedures.” A Vehicle shall be given two (2) warm-up laps. The Organizers may add or remove warm-up laps, as they deem appropriate.

The Final Race Qualification requires Teams to complete ten consecutive solo laps of the IMS oval (~25 miles) in 15 minutes or less (i.e., averaging ≥ 100 MPH avg.), and complete at least one of those laps in 75 seconds or less (i.e., averaging ≥ 120 MPH avg. for that single lap) (the “Round 4 Requirements”) using an Vehicle. Teams who complete Final Race Qualification Requirements are eligible to participate in the Final Race.

Except as otherwise provided by these Race Rules, the Race Starting Lineup shall be determined by best single-lap time rankings, from fastest to slowest, with the fastest qualifier occupying the pole position, followed by the second fastest qualifier, third fastest, etc., down through the slowest qualifier. In the event two or more Vehicles post identical official
Qualification times, the Vehicles shall be ranked in the order in which the Qualification times were posted.

All Vehicles in the Qualifications order shall be given one guaranteed attempt provided they 1) entered the Qualifications staging line (a marked area on track days that is adjacent to Pit Lane) before Organizers declare the Final Race Qualification over, 2) did not pull out of line, and 3) follow the “Start, Restart and Finish Procedures” as outlined in Section 6.

Teams may attempt to qualify and/or improve their starting positions as many times as they wish during the Final Race Qualification Event by reentering the Qualifications line. Teams in the Qualifications line who have not completed at least one (1) attempt shall be given line priority and thus afforded the option to jump ahead of those in line who have already completed at least one (1) attempt.

Qualifying Vehicles must remain at IMS from the onset of Final Race Qualifications through the completion of the Final Race. Teams may petition ESN if major repairs are needed that require expertise that is only available offsite, which request may be granted or denied in ESN’s sole discretion.

11. Final Race

The beginning of Round 5 will consist of a static technical and safety inspection of all vehicles at IMS to ensure compliance with all rules, to verify the details of the Vehicle operation accordance with all ESN instructions, and to ensure safe Vehicle operation. Any deviations will be identified to the Team Leader for immediate action to bring the Vehicle into compliance. If a Vehicle cannot be brought into compliance within the timeframe set forth by ESN and to ESN’s satisfaction, in its sole discretion, it may be disqualified.

In recognition of the values of such Teams’ efforts to further the charitable and educational purposes of CICP and CICP Foundation, the following awards (“Awards”) will be: One million dollars ($1,000,000 USD) will be awarded to the first Team, two hundred and fifty thousand dollars ($250,000 USD) to the second Team, and fifty thousand dollars ($50,000 USD) to the third Team to cross the finish line in 25 minutes or less (i.e. averaging ≥ 120 MPH) in a head-to-head, 20-lap (~50 mile) race of Vehicles around the oval at IMS.

Impacting other Vehicles’ abilities to compete or otherwise impeding other Vehicles by undertaking maneuvers other than those traditionally found in motorsports such as IndyCar (e.g., line defending) is grounds for disqualification, as determined by ESN in its sole discretion. Any Team suspected of cheating or circumventing any of the Competition rules will be subject to disqualification from the Competition.

Teams will have the opportunity to protest or challenge race results via a procedure defined and shared in advance of Qualification and the Final Race.
12. Mechanical Conditions

Organizers shall determine whether a Vehicle involved in a crash or with a hazardous mechanical condition will be permitted to continue in the Event or must first return to the Pit Lane or the garage area for necessary repairs.

After repairs have been completed by the Organizer’s crew, the Vehicle is subject to visual or other inspection by Organizers prior to and/or during any further competition. If Organizers determine that further repairs are warranted, the Organizer’s crew must make those repairs before the Team’s Vehicle is permitted to return to Event.

13. Safety Requirements

Safe operations are a priority for the Organizers. All considerations to maintain safety for operators and the surrounding environment must be made. The following are the minimum requirements for all Teams and their systems during the competition. The Organizers may suspend Team operations and/or remove a Team from the Competition at any time for safety considerations.

Teams will be required to register all Team Members for attendance at IMS and must participate in all training and briefings required by IMS. In addition to complying with applicable law and regulations, each Team is expected to employ appropriate safety precautions in its Competition operations. In the event that the Organizers observe a potentially dangerous condition for the safety of personnel or the environment, it shall have the right to advise a Team that, until the condition is corrected, the Team’s activities must cease.

In all cases the Teams must adhere to all rules and regulations set forth by IMS. Teams that do not comply with rules may be disqualified from the Competition with no recourse against the Organizers or any of the Competition sponsors.

In addition, all items to be stored at IMS must be approved by IMS and must be managed in a manner that adheres to all applicable laws and regulations as described in the Competition Site Agreement. IMS has final say on whether an object can be used and/or stored at IMS. These decisions will be made during the registration process for each Round. IMS will approve items based on the spirit of the Competition, that is to say IMS will only ban those items that pose a danger to Teams, IMS, visitors, and the environment for which Teams cannot show an appropriate management policy.

Any aspect of Vehicle activity or operation that has an unacceptable impact on the environment is prohibited. These activities include destructive Vehicle behavior, the use of abnormally hazardous substances or materials, and generally reckless operation. Potentially hazardous equipment or activities must be identified to the Organizers for review.
It is primarily the Team’s responsibility of handling emergency situations in the software deployed on the Competition Team computer. This includes but is not limited to (i) receiving a ‘Red Track Condition’ signal from Race Control; (ii) a lost communication heartbeat with Race Control; and (iii) a critical fault received from diagnostics. In these situations, the competition team computer shall compute the necessary commands for steering and braking and communicate them to the Vehicle’s Raptor ECU. The software deployed on the Raptor ECU will only implement a safety/emergency stop procedure that engages in the following situations: (i) the communication heartbeat between the Competition Team Computer and the Raptor is interrupted; (ii) a Purple Vehicle Signal is received from Race Control. After a time-out is reached the (Raptor) ECU will execute a safety stop, aiming to stop the Vehicle as quick as possible. However, due to the lack of sensing capability, only strictly limited maneuvering will be possible. Apart from the above two scenarios, the Raptor ECU will not interfere with or override any commands coming from the Competition Team Computer. The Teams are expected to account for any other scenario where emergency braking might be required, for instance due to close maneuvering in racing conditions.

Teams must provide Organizers with a brief writeup and/or other documentation of their Vehicle’s safety concept, including how their Vehicle’s software is programmed to avoid collisions, as well as handle unforeseen circumstances such as hardware failures and environmental circumstances. Additional details of the writeup and/or other documentation requirements will be provided to Teams in advance of Round 4. Teams must also demonstrate basic vehicular capabilities including red condition, lost heartbeat, and critical fault in advance of track use.

In advance of Rounds 4 and 5, ESN may provide additional instructions for the administration of activities as well as emergency procedures and instructions for handling other contingencies. Compliance with these instructions is mandatory whenever the Team or its Vehicle is within IMS-controlled areas. Failure to comply with these instructions may result in disqualification.

Race Control will have the ability to disable a Vehicle by issuing a Purple Vehicle Signal should dangerous or otherwise non-permitted operation be observed or expected. Details of Vehicle behavior under Purple Signal condition will be posted on the Website in advance of Teams’ receipt of Vehicles. All Teams must follow all on-track instructions or any competition Organizer or be subject to disqualification and/or removal from the Competition.

Intentional Interference and Damage

Intentional interference with other Vehicles is prohibited. Intentional interference is any activity that, in the opinion of the Race Director, is intended to degrade another Vehicle’s ability to compete.
Any Team responsible for the intentional damage of property that does not belong to that Team may be disqualified by ESN in its sole discretion. Intentional damage includes damage that occurs as a result of failure to prevent damage that could have been foreseen and includes damage that adversely and materially affects the performance of another Team. The Judging Panel will have the final say in all matters involving damage.

Teams’ Contact With Vehicles

A Team may not make or cause physical contact with its Vehicle after it has departed the pit exit and before it is returned to the Team. Contact with the Vehicle may only be permitted if the Vehicle has been disqualified or as otherwise determined by the Organizers. Physical contact includes indirect contact with tools and human-initiated contact using remotely controlled or electronic equipment.

14. Calendar of Track Activities

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<td>Practice Days @ IMS #2</td>
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<td>Practice Days @ IMS #3</td>
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<td>Final Race Qualification @ IMS &amp; Round 4 Close</td>
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