

NSVC Cover



NSVC
AN INNOVATIVE JOURNEY
NATIONAL SOLAR VEHICLE CHALLENGE

RULEBOOK 2020

VERSION 4.0

1. FOREWORD

This document contains the scope and details the National Solar Vehicle Challenge 2020. It contains valuable information please read it carefully.

This document and its schedules will be regularly updated and detailed online. Teams are urged to regularly visit the website, www.dynamistmotorsports.com or www.nsvc.in for the latest version of the document and schedules. Dynamist Motorsports will not be responsible in case any of the teams use outdated version of the Challenge document or schedules.

1.1.SUMMARY OF CHANGES

VERSION	DATE OF RELEASE	NATURE OF CHANGE
4.0	13 th July 2019	First Release

NATIONAL SOLAR VEHICLE CHALLENGE

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NATIONAL SOLAR VEHICLE CHALLENGE

EVENT CALENDAR

S. No	Activity	Date
1.	Registrations start (online)	14 th July 2019
2.	End of Registration	20 Sept 2019
4.	Start of online virtual round phase 1	20 th Aug 2019
5.	Pre-event induction Workshop(online/offline)	Visit website
6.	End of Virtual Round	15 th Oct 2019*
7.	Result of Virtual Round	21 st Oct
8.	Post Event workshop	25 th Oct - 6 th Dec 2019*
9.	Submission of Final Design Report	10 th Jan 2020
10.	State / Zonal (Pre-selection Dynamic round for Arma Class)	10 th -24 th Jan 2020*(3 day zonal test event)
11.	Result selected team for National round	8 th -12 th Feb 2020*
12.	National level Dynamic phase	28 th Feb - 7 th March 2020*

***NOTE:** Days may increase/decrease depending upon different circumstances.
On Zonal/state Pre-dynamic round will last for 2 days in each zone

2. ABOUT NSVC INDIA

2.1. NATIONAL SOLAR VEHICLE CHALLENGE OF INDIA

Since 2016 NSVC of India had created revolution by enhancing the level of Engineering in development of solar car. For its 4th edition, the National Solar Vehicle Challenge 2020 of India focus on developing solar powered electric car which can operated in closed campus and further commercial purpose. NSVC OF INDIA aims to raise awareness among upcoming Engineers, Industrialists and the public regarding advancing the sustainable vehicle technology efficiency in the automobile industry.

EVENT SUMMARY

The competition challenge teams of students, universities, industrialists and sponsors and to bring them together at one platform, in order to detect the most promising young talents and the most innovative ideas and support their development. Official host Dynamist Motorsports extends a very warm welcome to all teams competing in the Challenge

2.2. DESCRIPTION OF CHALLENGE IN NSVC 2020

To design and build vehicles capable of carrying a driver the maximum distance on a single charge powered by solar. The formation of new teams is actively encouraged, with the responsibility for mentoring and promoting new teams shared between the event organizers and established teams. NSVC INDIA will makes every effort to ensure its events are as safe as possible for teams.

2.3. DELIVERABLES

Parameter	Arma Class	Fleet Class
Design & Cost	Affordable designs - keep costs as low as possible. No cost Limitation.	Make system reliable and have load carrying capability of minimum 800 kg
Motor type	Any type of Electric motor is allowed	Any type of Electric motor is allowed
Maximum Voltage and Power limit of Motor	60 V, 3 KW	96V, 6 KW

2.4. EVENT CLASS

Arma Class	Fleet Class
Single person, light weight, highly efficiency electrical vehicles with 3 or 4 pneumatic tires. They must meet specific design and safety guidelines and rules as mentioned in the rulebook.	Multi-purpose solar powered car that will not only be purposed for transportation but can also be used for various power/load carrying work both outdoor and indoor like. City Mall, hospitals, Campus Utility

2.5.VISION & MISSION

- ✓ The Vision of National Solar Vehicle Challenge is to stir the minds of young technocrats to work towards sustainable model of solar powered electric car.
- ✓ Dynamist motorsports continuously engaged in developing Platform to face solve real life system
- ✓ Dynamist Motorsports the organising board of NSVC INDIA targets to make ways of Indian EV STARTUP by developing advance platform before 2021.

2.6.ENTRY & JUDGING CRITERION

The vehicles will be judged in a series of 3 rounds viz.

1. Virtual round (SCREENING)
2. Technical Inspection (Static Event)
3. Dynamic Event in two level **A) State/Zone Level B) National Level**

***NOTE:** In case of any conflict arising at the event venue, the judge's decision will be final.

2.7.OFFICIAL ANNOUNCEMENTS

Official Announcements and information regarding NSVC will be made known via official website only.

www.dynamistmotorsports.com www.facebook.com/growings7/
www.twitter.com/Motorsports_DMS www.instagram.com/dynamistmotorsports

2.8.TEAM UNDERTAKING

Each Team hereby undertakes to:

- ✓ Become an Ambassador of the Dynamist Motorsports by promoting and spreading its message about use energy efficient vehicles and its innovations
- ✓ Present its project at DCD (visit official website) held during the Event after racing where teams are invited to present their project to other participants, professionals and the public. Apart from describing their Team and the conditions surrounding the preparation, emphasis should be placed on the technological innovations, conceptual choices and the technical solutions adopted to attain the best possible level of energy efficiency.
- ✓ Publish on its website and other means of communication, about the organizers and their work.
- ✓ Each team undertakes to indemnify the Organizer and the Organizing Partners fully, permitted by law, against all liabilities, costs, expenses, damages and losses including any direct, indirect or consequential losses, loss of profit, loss of reputation and all interest, penalties and legal costs on an indemnity basis and all other costs and expenses sustained or incurred by the Organizer or the Organizing Partners arising out of or in connection with a breach of this Clause.

3. RULES ASSOCIATED WITH NSVC 2020

3.1. RULES AUTHORITY

Team registering for NSVC 2020 will be abiding by the rules laid down by the NSVC India organising Committee. NSVC reserves all the rights to change any rule of the event for the betterment of teams. Violation by any of the participating member will be liable to be penalized in terms of points or disqualification from the event.

3.2. RULES VALIDITY

The rules will be same throughout the event and scheduled as per decided by NSVC 2020. Any improvisations will be made known via email/ WhatsApp group and same will be uploaded on the website.

3.3. RIGHT TO IMPOUND

NSVC reserves the rights to impound any vehicle on site for inspection and examination by organizers, officials and technical inspectors.

3.4. COMPLIANCE TO RULES

By registering for NSVC 2020 the team members of team as individuals, team advisors and other personnel of the respective College/ University agree to comply with and be bound by the rules and all rules interpretations or procedure issued or announced by the NSVC 2020 Organizing Committee. All team members, faculty advisors and other university/college representatives are required to cooperate with and follow all instructions from competition organizers, officials and judges.

3.4.1 General

- a. The rules stipulated herein apply to the events organized in 2020. One event may be composed of one or more races.
- b. All participants of each event are expected to have read, understood and agreed to the Technical Regulations.
- c. The organization will penalize all participants and teams that ignore or violate the Technical Regulations. Penalties could be given in the form of warnings up to and including disqualification and elimination from further participation.
- d. All questions concerning the interpretation of the Technical Regulations must be submitted to the organization in writing.

3.4.2 Technical condition and safety

All participants are responsible for the technical condition and safety of their Vehicle during event period, the design must be made such that their car can safely participate in the final event considering all aspects of the event (racing, storage in the pit area etc). Approval of the design and approval during the inspection will under no circumstances exempt the participants of their responsibility.

3.4.3 Vehicle Eligibility

- a. Vehicles entered the competition must be conceived, designed and maintained by the student team members without direct involvement from professional engineers, racers, machinists or related professionals.
- b. The student team may use any information from professionals or from academics as long as the information is given as a discussion of alternatives with their pros and cons.
- c. Professionals may not make design decisions or drawings.
- d. Students should perform fabrication tasks where ever possible

4 TEAM REGISTRATION GUIDELINES

4.1.TEAM REQUIREMENT

Participation is open to all Indian citizens, Indian institutions and organizations with the condition that the work done in solving the vehicle challenges is carried out within the geography of India. Individuals who are not Indian citizens, but live and study/work in India can also participate – as a part of teams or on their own.

Teams can represent any of the three categories defined below.

- ✓ An Institution
- ✓ (Eligible individuals or teams who choose to and are authorized to represent the institution)
- ✓ An Organization
- ✓ (Eligible individuals or teams who choose to and are authorized to represent the organization)
- ✓ Private (Any individual or team who would like to participate in a private capacity)

4.2.REGISTRATION GUIDELINE

Team applying for NSVC must pay attention to the following details:

- a) They must have a meaningful team name & logo, a team captain and faculty facilitator.
- b) Not more than 5 teams can register from a single college.
- c) In case of multiple registrations from a single college only the faculty advisor can be same, but team name and logo must be unique.
- d) In Arma Class minimum of 12 and a maximum of 25 members can register in a team
- e) In Fleet Class minimum 15 and a maximum 40 members can register in a team.
- f) Online registrations will be open on our website from 11th July 2019 onwards till 27th September 2019.
- g) Teams will register through our official website (www.dynamistmotorsports.com and www.nsvc.in)

4.3.REGISTRATION FEE & MODE OF PAYMENT

Total amount to be paid favour of

A/C Name: DYNAMIST MOTORSPORTS PRIVATE LIMITED

A/C Number: 037805003323 A/C Type: CURRENT IFSC CODE: ICIC0000378

Virtual Entry phase	EVENT PHASE- Virtual round	Registration fee all classes
Level 0	TEAM NAME REGISTRATION	INR 3650 (non-refundable)
Level 1	TEAM MEMBER REGISTRATION	INR 7850 (non-refundable)

Fee for further round

Dynamic Entry phase	EVENT PHASE- Dynamic round	Registration fee Arma class
Level 2	State /Zonal Level	INR 14750 (non-refundable)
Level 3	Final National level entry	

Dynamic Entry phase	EVENT PHASE- Dynamic round	Registration fee Fleet class
Level 2	State /Zonal Level	INR 27500 (non -refundable)
Level 3	Final National level entry	

Note

1. Participating team holds the right to pay Level 2 &3 round entry fee after qualifying Level 1 previous phase, to Participate in further round
2. Level 3 Entry is on basis of result need submit college level technical inspection sheet within date mentioned in Event Schedule which will be given after virtual round result.
3. The registration money can be paid through UPI, IMPS, ONLINE BANKING
4. Teams are required to mail their transaction details within 2 days of registration at payment@dynamistmotorsports.com, else their registration will be discarded.

Fraudulent in payment is an act of crime and is punishable

5 VEHICLE DESIGN GUIDELINES

Building a competitive and safe vehicle is the challenge. NSVC 2020 combines speed, handling and lightweight design to create a balanced performance Vehicle. These guidelines offer suggestions to assist you in achieving that goal. Since safety is of key concern These rules will be in force and these requirements must be maintained during the entire competition.

Experimentation of design and ingenuity are encouraged, but keep in mind the intent of safe competition for the driver and the other participants of an event. If a new concept is being attempted that does not fit the rules exactly it may be wise to contact an event official or an officer of NSVC 2020 before proceeding with construction. It would be unfortunate to complete a vehicle and then have it disqualified at competition.

***NOTE:** Please remember that safety is our prime concern.

5.1.FRAME

The vehicle body is only required to be structurally strong if the frame does not provide adequate protection from an impact. If the frame is not sufficient, then the body must be constructed to protect the driver in the event of an impact. vehicles must have frame members that protect the driver in the event of collisions from any direction. Frames may be constructed of various materials and styles providing that the material(s) or methods provide adequate structural strength for protection/safety. The design will need to be structurally sound in the opinion of inspectors and/or race officials.

The legs and feet must be enclosed to prevent them from leaving the vehicle in an accident and provide protection against a frontal impact. The vehicle must not have any sharp edges, corners or protrusions that could cause injury. Any questionable exposed portion of the vehicle should be cut off, rounded off or blunted with durable padding. The vehicle must have a fixed floor pan that prevents the driver's body from contacting the ground.

5.2.CHASSIS DESIGN REQUIREMENTS

The chassis is the backbone of your vehicle. You should try to keep your chassis as simple and straightforward as possible. While weight is a prevalent concern, it is only one of several factors that contribute to a successful vehicle design. Reliability is the key to winning.

The vehicle can have four (4)/three (3) wheels. The vehicle must have a wheelbase within the range of 45 inches to 85 inches (**Arma Class**) and 65 inches to max 95 inches (**Fleet Class**) The mountings and designing of chassis should be such that there should be minimum 2 inches clearances between the driver and any component of the vehicle

5.3.CHASSIS MATERIAL

The tube/rectangular pipe used in the fabrication of the chassis or the other frames/supports may be seam or seamless. Minimum cross section must be 1 inch (25.4mm), for pipe it will be OD and for rectangular section or square section it will be its minimum height.

5.4.WHEELBASE AND WHEEL TRACK

The wheelbase of the vehicle must be within 40-70 inches and 45-95 inches for Arma Class & Fleet class respectively and the wheel track (front or rear) must not be less than 70% of the wheelbase of the vehicle.

Minimum Parameter (in inch.)	Arma Class	Fleet Class
Length of vehicle		≥135
Wheel base	45-85 inches	65-95 inches
Width		>65
Ground clearance	3.5(min)	5(min)

5.5.WHEELS AND TIRES

- Tires must be a pneumatic (inflatable) type.

- There is a minimum tread depth of 1.5mm. Tires on the same axle must have the same manufacturer, size and compound.
- While in driving position the driver's body must not encounter with wheels.

5.6.GROUND CLEARANCE

With the driver aboard there must be a minimum of 3.5 inches (Arma Class)/ 5 inches (Fleet Class) of static ground clearance measured from the lowest point (except tyres) of the vehicle, under the complete vehicle.

No compensation (like chain sprocket, brake disc in ground clearance would be entertained).

5.7.STABILITY

- 5.4.1 It is very important that the centre of gravity of your vehicle be located below the axles.
- 5.4.2 The vehicle must be stable at rest, while cornering, braking, and at top speed.
- 5.4.3 The track and centre of gravity of the vehicle must combine to provide adequate rollover stability

5.8.VEHICLES WEIGHT

Parameter (in Kg.)	Arma Class	Fleet Class
Without driver	300	450
With Driver	360	510

Even 1 Kg more than the given limits will lead to disqualification.

5.9.BUMPER (FRONT AND REAR)

Bumpers must be installed in the front and rear of the vehicle such that they cover the tyres and protect them from any collision which may occur on the track. They must be made of steel tubes. Minimum OD 1 inch (25.4mm) and minimum wall thickness 2 mm

Bumper (in mm.)	Arma Class	Fleet Class
Minimum OD	25.4 mm	25.4 mm
Minimum wall thickness	2 mm	2 mm

5.10. STEERING SYSTEM

Good steering geometry is very important for control at any speed. Determining the length and position of all the elements is probably best determined by trial and error, so build in as many extra mounting holes as you can.

- ✓ The steering system must be able to control (simultaneously) at least two (2) wheels.

- ✓ The steering system must have positive steering stops that prevent the steering linkages from locking up either in RH or LH turning.
- ✓ Total allowable free play (inclusive of play in all the steering linkages) is limited to 10 degrees, measured at the steering wheel. The steering wheel must be mechanically connected to the front wheels, i.e. steer- by-wire or electronic steering is prohibited.
- ✓ Joints between all components attaching the steering wheel to the steering rack must be mechanical and visible at technical inspection. Bonded joints without a mechanical backup are not permitted. The mechanical backup must be designed to solely uphold the functionality of the steering system.

5.11. BRAKES AND AXLES

If you can't stop, you can't go. In the Challenge, your ability to brake well will help you make that critical pass to win or avoid a certain collision.

- ✓ At least two wheels must have brakes. Brakes must be fitted to two wheels of the same axle either front wheels or both rear wheels depending on vehicle construction.
- ✓ The two brakes must have separate actuation cables. If both brakes are to be actuated by a single hand or foot lever, then both cables should be attached to the lever. Regenerative braking is permitted in addition to conventional brakes.
- ✓ Safety wire or cotter pins must be used to secure all wheel axle nuts

Note: -The vehicle must not roll if pushed while brakes are applied. The vehicle must be able to demonstrate a straight stop from a speed of 40 KMPH in less than 20 feet. Whatever you use, make sure you can actuate them both evenly.

- ✓ Use of BREAK OVER TRAVEL SWITCH is mandatory which helps to stop your vehicle in case of a brake failure as part of the shutdown circuit.
- ✓ A brake pedal over-travel switch must be installed on the vehicle and their switch must be a mechanical single pole, single throw (commonly known as a two-position) switch (push-pull or flip type).
- ✓ This switch must be installed so that in the event of a failure in one or both of the brake circuits the brake pedal over travel will result in the shutdown circuit being opened.
- ✓ This must function for all brake pedal and brake balance settings used to drive the vehicle.

Note-If there will be repeated actuation of the switch then it must not close the shutdown circuit, and it must be designed so that the driver cannot reset it. The switch must be implemented with analog components, not incorporating programmable logic controllers, or similar functioning digital controllers.

5.12. SUSPENSION

Use of suspension system is mandatory, it must be used in all wheels.

Minimum Suspension	Arma Class	Fleet Class
Total travel time	2 inches	4 inches

5.1.LOCK NUTS & BOLTS

Locking nuts are mandatory to be used everywhere in the vehicle. Failure to fulfil this, team will not get "T.I. OK" for the vehicle.

All bolts used in the system must meet metric grade M8.8. Fasteners used should not be less than grade 8.8 hardness. Thread lockers, spring washers are prohibited. All fasteners used should have min 2 threads visible past the nut.

5.2. VEHICLE POWER TRANSMISSION

Most vehicles use a direct drive chain (like a bike) or belt drive adapted to fit a bike threaded rear wheel gear. Unless you are using regenerative breaking, you will want the drive to freewheel when you let off the power. Alignment and tension are two important parameters. Too loose and it will pop off if the drive wheel flexes in turns and bumps; too tight and the friction will cost up to 5% power loss. Gear ratios are critical in tuning your performance and Range.

5.3. FRONT BODYWORK

The bodywork of the front part must be designed such that the vehicle number and the team logo must be displayed clearly. If the front body work is provided, drivers must be able to exit their vehicle as it is driven in competition, unaided in 6 seconds.

5.4. VEHICLE NUMBERS

- ✓ All vehicles must display assigned vehicle competition numbers. Vehicle numbers must be at least 8*8 inches. **Nsvcxx20**** Where XX represent state code ** team code
- ✓ Numbers must be clearly visible on both sides of the vehicle. The numbers must be in a contrasting colour to the vehicle or number background.

6 ELECTRICAL SYSTEM

Electrical system must include at least two power sources:

- a) Battery pack: Motor, controller, Brake light and all other equipment should use this power source (For Electrical Innovations the power supply must be taken from this battery Pack or Solar Panels).
- b) Solar power: To charge batteries and supply power for vehicle to run directly on solar. Participants should give details of solar efficiency with proper written readings and all calculations.
- c) Wiring must be well insulated and securely attached to the frame or body. All wiring must be kept free from moving parts and protected from sharp edges. No part of the electrical system may use the vehicle frame as a conductor.
- d) NLV & GLV must be specified and fuses must be insulated.
- e) The brake light, and any reverse light and alarm, must be powered whenever the vehicle is in motion.

6.1. MOTOR AND ITS CONTROL UNITS

6.1.1. Motor

- Teams can use DC motor of any type.
- No constrain on torque and RPM but only electric motors are allowed
- All motor wires must be connected to the accumulator through a motor controller

- There should be proper casing of motor and Controller to minimize/prevent any hazardous situation

6.1.2. Motor overcurrent protection

- Every electrical system present in vehicle must have appropriate overcurrent protection.
- The continuous current rating of the overcurrent protection must not be greater than the continuous current rating of any electrical component, for example wire, busbar, cell or other conductor that it protects. I.e. if multiple pins of a connector are used to carry currents in parallel, each pin must be appropriately protected.
- All overcurrent protection devices must be rated for the highest voltage in the systems they protect. All devices used must be rated for DC.

All overcurrent protection devices must have an interrupt current rating which is higher than the theoretical short circuit current of the system that it protects.

6.1.3. Grounded Low Voltage System (GLVS)

- The GLVS must be grounded to the chassis.
- The GLVS must not use orange wiring or conduit.

6.1.4. Motor power limitation

- ✓ The maximum voltage and power drawn from the accumulator must not exceed as given in table below.

Parameter	Arma Class	Fleet Class
Motor Type & Capacity (in KW)	3.0 KW. Any type	5.0 KW. Any type
Max Operating voltage (in Volt)	60V	96V

Note: -

- In case teams want to use regenerating energy then it is allowed and unrestricted but only when the vehicle speed is ≥ 6 km/h
- Teams are free to use any transmission, such that maximum speed of the vehicle on a plain terrain must not exceed 60 km/h on full throttle.
- It is mandatory to install a reverse gear. The adapter for motor & Transmission is to be designed and installed by students as per the type of transmission used. The transmission system should be clearly visible at the time of engineering design test event.

6.1.5. MOTOR CONTROLLER

Any type of power (speed) controller is allowed. Power to the motor must be controlled by the driver and turn off automatically when the driver releases the accelerator ("dead man" cut-off). The driver must have complete manual control of the vehicle and make all operational adjustments.

6.1.6. BATTERY AND ITS CHARGING

1. Teams can use all types of cells except molten salt and thermal batteries are not allowed.
2. Fuel cells are prohibited. Either Li-ion, LiFePo₄, Lead acid battery (dry) can be used, In case of lead acid batteries, the only batteries that will not leak if punctured, such as gel cell, dry or AGM (Absorbent Glass Mat) will be allowed to participate at events in practice or in competition.
3. Voltage output of battery pack should not exceed its given limitation.
4. Maximum Current capacity of battery pack should not exceed 70 Ah (ampere hours) in Arma Class and 100 Ah for Fleet Class.
5. Supplement Batteries must be able to provide power to safety items (brake light) for the duration of entire event. It must have low battery warning system
6. Batteries must display all original manufacturers' labels. Batteries must be commercially retailed and available to any competitor. Custom built or specialized batteries are not allowed. Batteries must be stock and unmodified in any way and meet all conditions of the manufacturer's written warranty.
7. Batteries may be recharged by regenerative braking. Batteries must be securely attached to the vehicle in such a manner to withstand an impact or roll-over. Batteries must be covered completely with an insulating material. Teams must present a report on charging and discharging rate of the battery.

6.1.7. NEW CHALLENGE REQUIREMENT

1. **Solar Power Charging Station** (Concept) – NSVC PHASE 2 EVENT is designed to simulate a “real world scenario”. For this they had given team a new challenge to come with Solar Powered Charging Station that would be used to charge the vehicle with following rules
 - a) Array size - an array not larger than 6 meters by 2 meters.
 - b) Solar Cells must be 16% efficiency
 - c) Location – charging station after fixing in designated area
 - d) Must be permanent once set up; can be rotated
 - e) Stability/Durability – the solar power charging station must be a stable and capable of withstanding reasonable weather conditions.

2. Battery Box Exchange Procedures

- a) Batteries exchanged in designated area; monitored by judge Once installed, solar car moves back onto race course
- b) Teams can have two battery boxes: one battery box will be in the solar car; the other battery box will be charging at the Solar Power Charging Station.
- c) Battery packs half of defined limitation max each

6.1.8. PATH FOR WIRES AND PIPES

No pipelines/wire connections must go under the chassis. It is strictly prohibited. Doing so may lead to disqualification of the team.

6.1.9. BRAKE LIGHT

The vehicle must be installed with a brake light red in colour which is clearly visible from the rear. If an LED brake light is used, it must be clearly visible in very bright sunlight. This light must be mounted between the wheel centre lines. All the electrical connections done must be well insulated.

7. VEHICLE SAFETY GUIDELINE

7.1. VEHICLE SAFETY REQUIREMENT

7.1.1. KILL SWITCH

An isolation switch (kill switch) is required on all vehicles. This switch must have a break current rating that exceeds the maximum current drawn by the vehicle. An actuator may be attached to the switch for remote operation, if it is durable and reliable.

Internal and external means must be provided for both the driver and race officials respectively to actuate an isolation switch. The driver must be able to actuate the switch in driving position. Race officials must be able to actuate the switch from outside the vehicle without reaching in.

7.1.2. FIRE EXTINGUISHER

Each team must have at least two (2) nos. of 1 kg ABC type fire extinguishers, one to be placed with vehicle and the other with crew member at all dynamic events. Only fire extinguishers showing a valid approval are allowed. The approval should show the date the fire extinguisher was tested last and the date when the next test is due. The fire extinguisher must be mounted in a position such that it can be reached easily by driver from the normal seating position in car and cannot fall after taking it out of its attachment. In addition to the manually operated fire extinguisher an automated means of fire extinguishing may be installed

7.1.3. WARNING SYSTEM

- ✓ There should be proper warning signal indicator by both light & sound Turn Signals,
- ✓ Hazards sign must be placed as defined by NSVC authority
- ✓ CAN communication system must be installed in vehicle.

7.1.4. FIREWALL

- ✓ It should be made in such a manner that driver's body parts are not affected by the Battery heat at any time during the dynamic/static condition.
- ✓ The firewall must be made up of a suitable material use of acrylic/plastic/perforated sheets is prohibited
- ✓ There should be min 2 inches clearance between the firewall and the battery. Position the driver, batteries and motor so that the weight is carried low (to prevent flipping over), and near the centre of the car (to reduce the tendency to spin).
- ✓ All vehicles must demonstrate stability at rest, while cornering, braking and at top speed. Driver contact with the ground is not allowed.

7.2. DRIVER SAFETY GUIDELINE

7.2.1. DRIVER'S LICENSE & AGE

Every Team must have two drivers and both the drivers must be at least 18 years of age. Both drivers must have a valid Driver's License (Four-Wheeler) issued by the Government (Learner's License not allowed). Drivers must present their license copy when insisted by Technical Committee.

7.2.2. DRIVER'S SAFETY GEAR

All the parts of Driver's Safety Gear must meet the required rating (specified).

No driver would be allowed to drive the vehicle without the complete driver's safety gear in any of the dynamic event. The complete driver's gear of NSVC2020 will consist of the following items:

7.2.3. DRIVER'S SUIT

A fire-resistant one-piece suit made from a minimum of 1 layer that covers the body from the neck down to the ankles and the wrists must be used.

7.2.4. UNDERCLOTHING

It is strongly recommended that all drivers wear fire resistant underclothing (long pants and long sleeve t-shirt) under their approved driving suit. This fire-resistant underclothing should cover the driver's body completely from neck down to ankles and the wrists.

If you do not wear fire resistant underclothing, it is strongly recommended that you wear cotton underclothing (t-shirt and long underpants) under your approved driving suit.

7.2.5. HELMET

All driver are preferred to wear bright colour fluorescent helmet, Driver must be capable to communicate to one member of their team. The means of communication must have a broadcast range of at least 3 Miles. The means of communication must be integrated into the helmet of the driver, it should be waterproof and supplied with a battery of sufficient capacity to last at least one race without being recharged.

A well-fitting closed face helmet that meets one of the following certifications and/or is labelled as such

- Snell K2000, K2005, K2010, M2000, M2005, M2010, SA2000, SA2005, SA2010
- SFI 31.2A, SFI 31.1/2005
- FIA 8860-2004, FIA 8860-2010, ISI/BIS rated

Open faced helmets are not allowed. All helmets to be used in the competition must be presented during Technical Inspection where approved helmets will be stickered. The organizer reserves the right to impound all non-approved helmets until the end of the competition.

7.2.6. NECK SUPPORT

The use of neck support is compulsory. The neck support must be a full circle (360°). Horseshoe collars are not allowed.

7.2.7. GLOVES

Leather gloves with extra foam, biker's gloves are acceptable.

7.2.8. SHOES & SOCKS

- ✓ Fire resistant shoes made from acceptable fire-resistant material, shoes must be certified to the standard and labelled as such (Recommended) Damaged shoes may be disallowed by the inspector.
- SFI 3.3
- FIA 8856-2000
- ✓ All socks must be made from acceptable fire-resistant material, which covers the bare skin between the driver's suit and the boots or shoes.

***NOTE:** Sport shoes/ Canvas shoes can be allowed if the team fails to arrange the shoes as mentioned above.

7.2.10. Seat & Seat Belt

1. The seat mounting must be rigid enough to withstand the dynamic conditions while the driver is driving the vehicle on the track. The lowest point of the driver's seat must in side view not extend below the upper face of the lowest side impact structure member passing underneath the lowest point of the seat
2. Adequate heat insulation must be provided to ensure that the driver is not able to contact any parts of the vehicle with a surface temperature above 60°C. The insulation may be external to the cockpit or incorporated with the driver's seat or firewall. The design must address all three types of heat transfer with the following minimum requirements between the heat source and the part that the driver could contact:
 - (a) Conduction insulation by:
 - (i) No direct contact, or
 - (ii) a heat resistant, conduction insulation material with a minimum thickness of 8mm.
 - (b) Convection insulation by a minimum air gap of 25mm.
 - (c) Radiation insulation by:
 - (i) A solid metal heat shield with a minimum thickness of 0.4mm or
 - (ii) reflective foil or tape when combined
3. All solar car must have a DYNAMIST MOTORSPORTS approved two-six-point racing harness that is equipped with a quick release buckle.

Be sure to regularly check your safety belts for damage such as fraying, tearing, etc. If this should occur, the safety belts should be replaced immediately. NSVC inspector may require replacement of the belts if they are damaged. The safety belts are like a helmet, in that they are designed for protection in only one major impact. If you have had a significant incident, the manufacturer strongly recommends immediate replacement of the belts. Also, make sure that your safety harness is totally secured and that you have pulled the straps as tight as possible anytime you drive the car

7.2.11. Driving Position

Drivers must be in a sitting or recumbent (reclining) position. A kneeling, or prone (head first) position is not permitted. Arms and legs must remain within the vehicle body structure during competition.

7.2.12. Driver Visibility

The driver must have adequate visibility to the front and sides of the vehicle. Seated in a normal driving position, the driver must have a minimum field of vision of 200° (a minimum 100° to either side). At its size must be at least 8 square inches of usable mirror surface area. Mirrors are required on both sides of the vehicle

The mirrors must allow the driver to see clearly to the rear on both sides of the vehicle.

7.2.13. Driver Egress Time

All drivers must be able to exit their vehicle in less than 6s with the driver in the fully seated position, hands in the driving position on the connected steering wheel (in all possible steering positions) and wearing the required driver equipment as in T4. The egress time will stop when the driver has both feet on the ground.

7.2.13. Driver's Leg Protection

All gears, chains, and sprockets, moving suspension and steering components and other sharp edges inside the cockpit, must be shielded with solid material. Every part must be covered to prevent injury to the driver or others in the event of mechanical failure. If there are covers over suspension and steering components, they must be removable to allow inspection of the mounting points.

8 VIRTUAL ROUND

Virtual round is just a preliminary inspection of the vehicle design in which all the research development design is to be elaborated by the respective team in a brief presentation before the judges within each span time 1hr. Right after completion of presentation, there will be an interaction with the judges for a minimum 30 min in which questions related to the vehicle design presented would be asked to the representatives of the respective team and suggestions would be made if necessary.

Virtual for **NSVC 2020** will be ONLINE/OFFLINE both.
Documents to be presented during virtual:

- About Team (how it was formed)
- CAD Design
- Design Report
- Innovation Report
- Cost Report
- Design Validation Plan
- Gantt chart

8.1 CAD DESIGN

Different 3D CAD views (Front/Top/Side) of fully assembled design of the vehicle must be presented in this report. Body works other than similar in professional must be justified.

8.2 DESIGN REPORT

The design report must contain all the necessary details with proper calculations related to the vehicle like analysis, transmission, steering, braking, innovations etc. This report must not exceed 15 pages and it is recommended to provide at least three different views of vehicle with proper dimensions. This will be verified during Final Round.

8.3 COST REPORT

Even though there is no cost limitation in both classes but keeping the cost low will lead to extra points. The cost report must include all the calculations and cost of the parts procured and its machining cost as per market rates including all taxes.

8.4 DESIGN VALIDATION PLAN

The design validation plan is the assurance that a product, service, or system meets the needs of the customer and other identified stakeholders. It often involves acceptance and suitability with

external customers. All the virtual and real-time tests and analysis are to be included in the design validation plan.

8.5 GANTT CHARTS

Gantt charts illustrate the start and finish dates of the terminal elements and summary elements of a project. Terminal elements and summary elements comprise the work breakdown structure of the project. This chart is basically the management of the project and distribution of different tasks in the team members with completion deadlines. The Gantt chart must be attached along with the design report.

8.6 VIRTUAL ROUND SCORE TABLE

S. No	Activity	Points
1	Presentation	100
2	Design report	200
3	Electric and solar system	150
4	Cost report	100
5	CAD design & Analysis	200
6	Innovation	100
7	Charts	100
8.	Survey Analysis	100
9.	Team Management	050
	Total	1100

9. ZONAL ROUND

To ensure the safety and rulebook compliances of all the vehicles there will be 3 day zonal level round for participating team in nearest zone. At each zone complete vehicle technical inspection will be done by NSVC technical inspector. At zonal level each team will makes full effort to ensure safety & feasibility of vehicle to participate in final dynamic round which includes Safety Check, Electric Drive Inspection, if team failed to do that team will not be allowed for dynamic phase event.

To better inspect only 20 entry will be granted at each State/Zonal level round to enhance the vehicle capability of team in every respect.

Entry in particular zone should not be less then 12 team on that case team will be shifted nearest zone to conduct event smoothly

10. NSVC NATIONAL ROUND

This is final stage for qualified NSVC participating team selected for national level. Where vehicle be tested at 3 stage 11 sub-stage of this event with a goal keeping in mind to make every team a perfect startup in future these are give as follows,

10.1 STATIC TEST

10.1.1 TECHNICAL INSPECTION

During the inspections, the participants are required to demonstrate the racing performance of their Vehicle which includes Safety Check Electric Drive Inspection, Driver safety gear, chassis material testing certificate and much more. If team's car fails to comply with the applicable requirements or the racing test then it not be allowed to enter the other test event until the time they do come into full compliance The team will be allowed only 2 chances for the TI test failing which the team will be considered disqualified for the dynamic events. So, every team must clear technical inspection to participate in dynamic round.

10.1.2. QUESTIONNAIRE

During technical inspection while examining the vehicle, judges will ask questions to any of the team members. The team members should be ready with their design report for their vehicle. Every team member is required to have a hard copy of the vehicle documents.

10.1.3. VEHICLE ANALYSIS

The vehicle will be verified with the final design report. Deviating up to 10% from the final design report is allowed but on further deviations teams will be penalized accordingly.

10.1.4. VEHICLE COST ANALYSIS

The cost report will be verified the actual cost of the components and systems used in the vehicle at the time of Dynamic Event. The cost of the components/systems mentioned in the cost report must not vary with that of used in the vehicle.

10.1.5. WEIGHT MEASUREMENT

In this round the lightest vehicle gets the maximum points. This round will take place after the technical inspection, teams who have cleared technical inspection will be eligible for this round.

10.1.5. MANUFACTURING QUALITY

The vehicle will be examined during technical inspection by the judges, so the participating teams are advised to manufacture the vehicle with pre-planned strategies so that the vehicle is the best reflection of your efforts. Good engineering practice will reflect a great manufacturing level.

10.1.6. INNOVATION

The innovation done in the vehicle need to be approved in Virtual Round after that it will be discussed with the team and its working will be examined by the technical inspectors in the respective paddock of the teams. Team needs to present innovation report at the time of explaining the innovation. The innovation should be working and not just the concept.

Note: Innovation must not be pre-fabricated or must not contain all pre-fabricated parts. Team need to make video submit of their innovation.

10.2 DYNAMIC TEST

10.2.1. BRAKE TEST

If you can't stop, you can't go. Remember so it's mandatory for a vehicle to pass the brake test to participate in NSVC 2020 dynamic events. The vehicle must stop in a straight line once the brakes are applied on the vehicle. Each vehicle will be given max 2 attempts to pass the brake test. Use of hand brake is Prohibited in test event car must be actuated by foot Paddle.

but team need to install their vehicle

Braking test will be done at both Low Speed and High Speed

NOTE: Without clearing brake test no vehicle will be allowed to enter race track as it involves risk for both driver and other participant's driver/spectator. Vehicle's speed must not be less than 40kmph while attempting brake test.

10.2.2. ACCELERATION TEST

AIM: Acceleration determines the time it takes the vehicle to accelerate along 100meter flat course.

PROCEDURE: Each team may make two (2) attempts but with different/same drivers. Best of the two will be taken as final score. Timing will be done by using either electronic systems or stop watches.

Acceleration score formula:

$$\text{Acceleration score} = 200 - [(T_{\text{longest}} - T_{\text{yours}}) / (T_{\text{longest}} - T_{\text{shortest}})]$$

Where: "T yours" is the best time of the team whose marks are being calculated, "T shortest" is the fastest time by any team and "T longest" is the max time taken by any team in the test.

10.2.3. AUTOCROSS

AIM: The objective of the autocross event is to evaluate the vehicle's manoeuvrability and handling qualities on a tight course running alone on the circuit. The autocross will test vehicles reaction to acceleration, braking, and tight corner steer abilities of one vehicle.

PROCEDURE: The vehicle will be staged such that the front wheels are 5m (16.4 feet) behind the starting line. The timer will start after the vehicle crosses the start line. There will be no order of the vehicles to run each heat. The organizer will determine the allowable windows for each heat and retains the right to adjust for weather or technical delays.

***NOTE:** Each team will be given two (2) attempts with different/same drivers. Best of the two will be taken as final score. Timing will be done using either electronic systems or stop watches.
Team not having reverse mode in their vehicle will not be allowed to participate.

Scoring Formula:

$$\text{Autocross score} = 200 - [(T_{\text{longest}} - T_{\text{yours}}) / (T_{\text{longest}} - T_{\text{shortest}})]$$

Where: "T yours" is the best time of the team whose marks are being calculated, "T shortest" is the fastest time by any team and "T longest" is the max time taken by any team in the test.,

Penalties:

- a.) Cones Down or out: Three (5) seconds per cone, including any after the finish line.
- b.) Missed Slalom: Missing one or more gates of a given slalom will be counted as one "off-course" per occurrence. Each occurrence will incur a twenty () second penalty.
- c.) Un-allowed team member running with vehicle: It will lead to 40 second penalty

10.3. ENDURANCE TEST

AIM: The Endurance Event is designed to evaluate the overall performance of the vehicle and to test the vehicle's reliability. Final Endurance test has two Stage

Stage 1 -Every car will have to drive a defined closed track inside campus.

Stage 2 -After qualifying Stage 1 team will be given chance to take trial on road by following all traffic guideline defined by Govt. of India

Note-

- vehicle must cover a specified distance in a given time of event, using solar energy and battery power only.
- Max Speed of Vehicle: 60 Kmph.

Endurance score – $250 \times (\text{LAP yours} / \text{LAP max})$

Only selected 20 QUALIFIER TEAMS WILL BE ELIGIBLE FOR Phase 2 OF EVENT

PHASE 2 (the super challenger event) Event regulation release will be issued in December 2019

Every qualified teams must cover maximum distance with travel time of 2.5-3 Hr in single charge

10.3.1. Technical Failure/Modification Endurance Round

In the case of the occurrence of a (technical) failure during endurance race, the participants are entitled to repair and/or replace the failed or flawed components with identical ones.

(in case of power source failure only battery repair is allowed. No replacement can be done).

The Organiser must be informed of any technical failure.

Modifying the car during a race, after the car has been technically approved by the Organiser, is not allowed.

Modifying the car in between races is allowed but must be reported to the Organiser before the start of the endurance race.

A participant will only be allowed to participate in the race after the modification has been inspected and approved by the Organiser.

PROCEDURE: The event will be run as a single heat approximately for 2.5-3 hours. Teams are not allowed to work on their vehicles in pits during the heat. A driver change can be made during a two (2) minute period at the midpoint of the heat. Passing another vehicle may only be done in an established overtaking zone.

Endurance Score Formula:

Endurance score = $350 * N \text{ yours} / N \text{ max}$

N max is the maximum laps covered by any team.

N Yours is the laps covered by respective team.

11. FLAGS

11.2. GREEN (start)

Competition has begun.

11.3. YELLOW (caution)

Drivers need to slow down and proceed with caution. A corner track official shall only wave their yellow flags if there is an immediate danger within a reasonably close distance beyond the corner that drivers need to be aware of before the corner, so they can avoid the danger.

11.4. RED (stop)

All vehicles stop at the Start/Finish line but remain in order and the clock is stopped until the race resumes.

11.5. BLACK

Your vehicle must stop in the pits. A furred black flag may be used to warn drivers of violations before forcing a full black flag and a pit. This use is limited to small violations not causing safety issues on the track. It would only apply to issues which the driver could correct while on the track, such as poor driving.

11.6. WHITE

Two minutes left in the competition.

11.7. CHECKERED

Competition is over. Pull off the track after crossing the finish line.

11. F&Q

1. What is the NSVC 2020?

The NSVC 2020 is India's biggest innovation event focused on uplifting maximum use of renewable energy and NSVC prize is awarded to teams who come up with disruptive innovations or solutions that solve pressing problems and/or create new opportunities.

"NSVCs", provides solution to problems, which, when solved could potentially change the way we live, work and play. It will Develop wide solution for transportation system and will develop in use renewable energy to technology

2. Why is Dynamist Motorsports Pvt. Ltd, setting up 4th season of NSVC 2020?

We have full confidence that Nation will only develop when technology and innovation combine with proper management. to add value, create jobs and improve the general standards of living. Today, despite a population of a billion+ and a favorable demographic profile the place where India lags is technology and innovation. We are confident that if an appropriate system is developed, India is be able to leap ahead and quickly achieve global standards in developing innovative solutions that solve problems, create opportunities and drive growth. It is this belief that has driven the setting up of **NSVC 2020**.

3. What does theme NSVC 2020 convey?

The theme of NSVC 2020 gives purpose of "challenging conventional thinking to drive positive change for all". Through the NSVC 2020, **Dynamist Motorsports** hopes to catalyze and resonate disruptive innovations from India.

4. Who can participate in the NSVC 2020?
Participation is open to all Indian citizens, Indian institutions and organizations with the condition that the work done in solving the NSVCs is carried out within the geography of India. People can participate in teams or as individuals. Please refer to ELEGIBILITY SECTION for more details on the eligibility criteria.
5. What are the NSVCs released at launch?
There are two events in NSVCs is being launched – one, the development of affordable solar powered single seater car another, and another development of solar powered car that have multipurpose use for indoor and outdoor activity with maximum load carrying.
6. Why has **National Solar Vehicle challenge** season 4 has made two categories
Buoyed by the success of the first 2 editions Dynamist Motorsports is to expand the solar-powered car event to embrace all clean energy sources.
The two categories in NSVCs have been chosen based on the following criteria.
 - a. This event will give solution to energy crisis and has the potential to greatly benefit society
 - b. The event NSVC is designed for the development in field of applied science/technology in automobile sector.

ELIGIBILITY & TEAM STRUCTURE

NATIONAL SOLAR VEHICLE CHALLENGE

1. Who can participate in the NSVC 2020?

Participation is open to all Indian citizens, Indian institutions and organizations with the condition that the work done in solving the NSVCs is carried out within the geography of India. Individuals who are not Indian citizens, but live and study/work in India can also participate – as a part of teams or on their own.

Teams can represent any of the three categories defined below.

- ✓ An Institution (eligible individuals or teams who choose to and are authorized to represent the institution)
- ✓ An Organization

(eligible individuals or teams who choose to and are authorized to represent the organization)

- ✓ Private

(any individual or team who would like to participate in a private capacity)

2. How many members can a team consist of?

A team can have a maximum of 25 members for Arma Class & 40 members for Fleet Class. Certificates of participation and/or winning will be restricted.

3. Is there a prescribed way of structuring a team?

All teams will have to nominate a Team Leader and two deputies during registration. All communication from NSVC 2020 will be to the Team Leader. In the absence of the Team Leader, communication will be sent to the two deputies. Apart from this, there is no specification on the composition or structure of the team.

4. I Am Not the Team Leader Can I Still Register My Team For The NSVC 2020?

No. The teams must be registered by the Team Leader only.

5. Our team is made up of members from different institutions. Can we participate?

Yes, you can. You can participate as a private team by listing full detail of every members

6. Can a team have members who are not Indian citizens?

Yes, it can, provided that the non-Indian members are working / studying in India during the phase of the NSVC event.

7. I am not an Indian citizen, but I work in India. Can I participate?

Any non-Indian residing in India, and associated with an Indian organization or institution, an Indian subsidiary of a foreign company, or Indian campuses of foreign schools or universities can participate provided that the work on the NSVC is carried out within the geographical boundaries of India.

8. Are only Indian institutions or organizations allowed to participate?

Participation is open to institutions and organizations that are located within India. This includes Indian subsidiaries of foreign companies, and Indian campuses of foreign schools or universities.

9. Can an Institute have more than one team representing it?

Yes, An institute/organization can have more than one team (max 5) representing them. Teams representing an institution/organization will have to submit an official letter, signed by an authorized signatory and carrying the official seal authorizing them to represent the said institution or organization.

10. We are a group of Indians studying in a foreign university abroad. Can we participate?

No, you cannot. The NSVC is open only to individuals/teams that work within India

11. I work for an MNC in India. Can I participate with my team?

Any individual or a team working in India can participate. You can even represent your company, provided that the work is done within the geographical boundaries of India.

12. I am working for a Dynamist Motorsports Pvt. Ltd company. Can I participate?

Yes, you can. However, you will not be allowed to represent “Dynamist Motorsports”. You can submit your application only as a “Private” entry and you will not use any of **Dynamist Motorsport’s** facilities/ infrastructure/funds.

13. I’m 15 years of age. Can I participate?

The Team Leader must be at least 18 years old. There is no age restriction for the rest of the team members.

14. Is there an agreement that I have to sign to be able to participate?

Yes, there is. When you submit your application, you will be asked to accept the Terms & Conditions (T&Cs) governing the NSVC 2020. You will have to indicate your acceptance of the T&Cs before you submit your application. Furthermore, another agreement will be made between NSVC 2020 and the participating team post the “Live Presentation” phase.

15. Are there reasons for which I can be denied participation?

Dynamist Motorsports Pvt. Ltd reserves the right to limit, or restrict upon notice, participation in the competition to any person, team or entity at any time for any reason.

16. Can I add a team member after I have submitted the application?

Yes, new team members can be added up to the “Pre/zonal event” phase. To do this, the Team Leader must submit a request to info@dynamistmotorsports.com with the following subject line: "Team Name, NSVC 2020: Adding new member". The maximum number of team members is **25 for Arma Class and 40 for Fleet Class**

17. I have not registered at dynamistmotorsports.com. However, my Team Leader has an account. Can she/he still register me as a team member?

Yes, the Team Leader can appoint team members at the time of submitting the application form. New members can be added to the team up to the “Live Presentation” phase. In order to do this, the Team Leader must submit a request to info@dynamistmotorsports.com with the following subject line: "Team Name, NSVC 2020: Adding new member".

18. Our Team Leader has quit. How do we change the Team Leader?

In order to do this, the outgoing Team Leader must submit a request to info@dynamistmotorsports.com appointing a new Team Leader with the subject line: "Team Name, NSVC 2020: New Team Leader".

19. Our Team Leader has quit. Can we appoint a member who is not the second in command as Team Leader? Yes. To do this, the outgoing Team Leader must submit a request to info@dynamistmotorsports.com with the subject line: "Team Name, NSVC 2020: New Team Leader".

20. One team member has quit. Can we remove him/her from the list? Yes. A team can remove members at any point. To do this, the Team Leader must submit a request to info@dynamistmotorsports.com with the subject line: "Team Name, NSVC 2020: Removing team member(s)".

12. INTELLECTUAL PROPERTY (IP)

21. Who will own the IP for all innovations my team generates? Ans-Your team (or the Institute/Organization you represent) will.

22. Can we use innovations generated elsewhere to build our solution?

Yes, you may, provided you have the legal rights to do so. However, you might want to consider the fact that the jury will give a disproportionate weight to "original innovations" while evaluating submissions!

23. Will Dynamist Motorsports have any claims on our team IP if we win the challenge?

No, **Dynamist Motorsports** has no claims whatsoever on a team's IP.

24. Will **Dynamist Motorsports** help us procure patents for our innovations?

Teams are expected to take all necessary steps to protect their IP and obtain patents. **Dynamist Motorsports** will not play any role whatsoever in helping teams obtain patents

25. Is the NSVC 2020 process overseen by an external agency?

Yes, in NSVC 2020, who provides recommendations on winner selection and overall workflow of the entire NSVC.

26. We represent an institution. Will the IP developed belong to us or the institution?

The matter of IP and who will own it rests solely on the agreement between the team(s) and the institution. **Dynamist Motorsports** will have no say whatsoever in this matter.

27. How many prizes are available? What are the amounts under each?

There are lots of prizes in all under the NSVC 2020. The minimum participation required is 30 in each category. If the number of participating team differs with respect to the count mentioned above, the organizers holds the right to alter the prize amount by 30 percent in all the two particular categories if participation less than said participants the details is given in prize table

28. When will the prize money be given?

After the close of the NSVC. The prize money will be paid within 21 working days of clearance of all legal formalities

29. Will tax be deducted at source when the prize is paid out?

Yes. Appropriate GST/Central/State tax/ laws in force during the processing of payments will be applied and tax will be deducted at source. Please note that all liabilities on tax matters will rest on the winning teams and it is the responsibility of the teams to ensure compliance to all applicable tax laws

30. We represent an institution. Will the prize be given to the team or the institution?

If the winning team represents an institution, the prize money will be given to the Institution's TEAM

31. We are a private team. Will the payout be made to all members?

No. The full & final payment of the prize money, post deduction of tax at source, will be made to the Team Leader in our records the day the prize is announced. Intra-team arrangements for a fair and equitable disbursement of the prize money is a matter for the team to work out Dynamist Motorsports Pvt. Ltd. will have no say whatsoever in this matter or in the matter of disbursement of the prize money between the team members.

32. Our team would like to know the when will the result announcement, prize Distribution ceremony and when the winner of event will get the prize/ trophy & certificate of achievement?

After successfully completing all the phase of event results

13. APPLICATION & EVALUATION

33. Can I apply for the NSVC 2020 from any other channel other than www.dynamistmotorsports.com ?Applications for the NSVC 2020 can only be made on www.dynamistmotorsports.com and www.nsvc.in

34. It is not possible for some of our team members to attend the Live Presentation phase, in screening phase Is it compulsory for all team members to be present during the presentations?

It is expected that minimum 6 team members be present at the time of virtual round. However, in case of exceptional circumstances, the cause of absence should be intimated to Dynamist Motorsports in advance. It is compulsory for the Team Leader to be present under all circumstances.

- 35.** Our team members are not available during the workshop. Is it mandatory to attend the same?

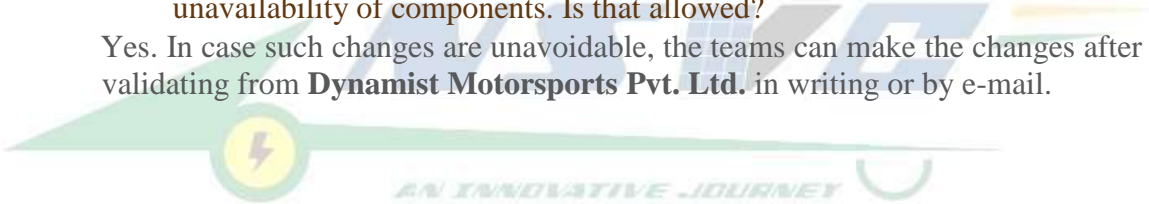
Attending workshops or other training programs which will be organized periodically is not mandatory and is at the discretion of the team. However, attendance is strongly recommended since all programs are expected to add value to the teams to ensure full vehicle knowledge.

- 36.** The components used by our team are not currently available. Can we get an extension for demonstrations of our prototype/final solution?

The teams are expected to finalize their choice of components/ technology in Virtual round and before Technical inspection phase of event it should be placed in vehicle. No deadline extensions would be provided.

- 37.** We need to make a few alterations in our prototype design due to the unavailability of components. Is that allowed?

Yes. In case such changes are unavoidable, the teams can make the changes after validating from **Dynamist Motorsports Pvt. Ltd.** in writing or by e-mail.

- 
- 38.** In case of loss of functionality, is there an alternate option to present our concept?

No. The innovation should be in a fully functional capacity at the time of presentations.

- 39.** Will Dynamist Motorsports disclose the evaluation parameters for the mentioned phases?

Dynamist Motorsports is not liable to disclose the evaluation parameters and their weightings. However, the NSVC document contains a list of evaluation criteria for the distinct phases. Teams can devise their work plan based on this criterion.

14. COMMUNICATION WITH Dynamist Motorsports Pvt. Ltd.

- 40.** How do I communicate with **Dynamist Motorsports Pvt. Ltd.**?

Teams can communicate by sending their emails to **info@dynamistmotorsports.com** or they can send written communications by

post/courier to the following address, with the following subject line: "Team Name, NSVC 2020: Query":

To,

Dynamist Motorsports Pvt. Ltd.

A-5 Nandram Park ,East Uttam Nagar, New Delhi 110059

41. What is the language to be used in official communication? English

15. MISCELLANEOUS

42. Will **Dynamist Motorsports** help me commercialize my innovation?

Dynamist Motorsports will make no commitments whatsoever to help teams commercialize their innovations.

43. Will miscellaneous expenses incurred by the team (e.g. travel) be reimbursed in sponsorship by **Dynamist Motorsports**?

No. **Dynamist Motorsports** will not reimburse any expense whatsoever. All expenses towards participating in the NSVC will have to be borne by the teams.

44. What if no team completes the NSVC? Who wins then?

The NSVC can have a winner only if the defined deliverables are met and a team is judged as having completed the NSVC. If no team is able to complete the NSVC, the jury has the right to recommend a closure to the NSVC. In this case, no prize payouts will be made.

45. Will the jury remain the same across stages? Or will they change from stage to stage?

While all efforts will be made to ensure that the jury stays constant, **Dynamist Motorsports** reserves the right to modify the jury during the course of the different stage of NSVC 2020

46. Will the finalists or the winners be recruited by **Dynamist Motorsports** during the later stages of the competition? Dynamist Motorsports is not promising any recruitment to any of the participants, however full guideline will be given where to showcase the capability.

47. Our innovation delivers the required criteria on the simulator. Is it necessary to demonstrate the same using the prototype to be eligible for the prize?

Yes. You need to have a working prototype to demonstrate the above-mentioned criteria. Simulation/incubator results can be submitted as support documents.

48. Our Vehicle innovation is not ready. Can we demonstrate the required results using a simulator/incubator to be eligible for the prize?

The above-mentioned criteria need to be demonstrated using a prototype. Simulation/incubator results can be submitted as support documents.

49. Will the criteria mentioned be the sole criteria for evaluation? If no, what are the other parameters? These are indicative evaluation parameters Dynamist Motorsports reserves the right to not disclose any evaluation parameters.

50. The **motors**/batteries that is used in our concept need to be shipped. Do we stand a chance to be eligible for the round even after the close of the stage/phase?

No. Teams need to showcase their prototype/final solution within the timelines mentioned in **rulebook** Website. No submissions will be allowed after the end of the stage close phase of technical Inspection.

16. AWARD & PRIZES

16.1 The Total Prize Money summing all categories is **16+** including the conditional Prize money.

16.2 Prize money is for enhancing the level of work standard and team working skill Participants.

16.3 If the number of participations exceeds the expected number of registrations the organizers will include few more dynamic tests for better refinement of teams, and the conditional prize money will be implemented

16.4 Virtual round winner & Runner up will be given Cash Sponsorship after 2nd round interview

16.5 D Cash is a virtual cash that a team can use to buy parts from Dynamist Motorsports and Register their team

16.6 For enhancing the student performance this year new category of award had been included given below

16.7. The given award will be in form of team certificate, gift hamper from event sponsors

Sr. no	Awarded to team for	Number of award
1	displaying the highest level of environmental awareness	4 zonal award
2	displaying the greatest application of Information System	1 National
3	displaying the highest level of technological achievement for new solar car team	2 National
4	team displaying the highest level of Engineering Excellence.	National
5	displaying the true spirit of solar car through distinguished service to their fellow teams	Zonal
6	best utilizing computer technology in the design, production, and racing of their solar car	National

7	displaying the true spirit of solar car racing.	Zonal
8	displaying the highest level of courage in the face of engineering obstacles.	National
9	displaying the highest level of good sportsmanship during the event Phase	National
10	for Applying best use Software for their vehicle (in virtual round)	screening
11	Displaying their team at web platform (in virtual round)	5 award
12	Team Mentor for guiding their team to work towards Sustainable energy	



NATIONAL SOLAR VEHICLE CHALLENGE

	<u>Category</u> <u>prize</u>	<u>Arma Class</u>	<u>Fleet Class</u>	<u>Other Award</u>
1.	Overall Champion	1,00,000	1,20,000	Trophy Check and appreciation Letter
2.	Runner Up	40,000	45,000	Trophy Check and appreciation Letter
3.	2nd runner up	20,000	20,000	Trophy Check and appreciation Letter
4.	Best Design	7,500	10,000	Trophy Check and appreciation Letter
5.	Virtual Winner	Sponsorship*	Sponsorship*	Trophy Check and appreciation Letter
6.	Best Endurance	10,000	15,000	Trophy, Check and appreciation Letter
7.	Runner-up Endurance	7,500	7,500	Trophy Check and appreciation Letter
8.	Best driver	5,000	5000	Trophy Check and appreciation Letter
9.	1st Lightest Vehicle	7,500	10,000	Trophy Check and appreciation Letter
10.	2nd Lightest Vehicle	5,000	7,500	Trophy Check and appreciation Letter
11.	Best Brake & Acceleration	5,000	7,500	Trophy Check and appreciation Letter
12.	Auto Cross Winner	10,000	11,500	Trophy Check and appreciation Letter
13.	Auto Cross Runner Up	5,000	8,000	Trophy Check and appreciation Letter
14.	B. plan winner	5,000	6,000	Trophy Check and appreciation Letter
15.	B. plan runner up	4,000	7,000	Trophy Check and appreciation Letter

	<u>Category</u> <u>prize</u>	<u>Arma Class</u>	<u>Fleet Class</u>	<u>Other Award</u>
16.	Best Innovation	10,000	10,000	Trophy, Check and appreciation Letter
18.	Best load Carrying	-	15,000	Trophy Check and appreciation Letter
19.	Best multipurpose use vehicles	-	10,000	Trophy Check and appreciation Letter
20.	Best Ergonomics	5,000	7500	Trophy Check and appreciation Letter
22.	Solar Endurance	5,000	5,000	Trophy Check and appreciation Letter
23	Slope endurance	-	5000	Trophy Check and appreciation Letter
24.	Team Spirit award	5,000	5,000	Trophy Check and appreciation Letter
25.	All win- win Award (Surprise Awards)	Upto 3,50,000 D Cash	Upto 5,40,000 D Cash	Trophy Check and appreciation Letter
Total Prize		6,00,000+	10,00,000	