TEAM:	**#**

Station	**Grade**	**Comments**
Array		
Driver		
Body & Sizing		
Electrical		
Battery Protection		
Mechanical		
Dynamics		

TEAM:	**#**

Regulation	**Grade**	**Comments**
Solar Array Output		
Voltage		
Amperage		
Power		

Station Manager:

_____

Entrance:

Array disconnected from battery.

TEAM: #

Regulation \ Driver	Driver 1	Driver 2	Driver 3	Driver 4
8.1 Driver is registered with headquarters (has ID)				
8.1 Driver is 18 or older and has valid Driver's License				
8.3.A Driver Helmets – Type/Rating				
8.3.B Driver Shoes – Valid shoes				
6.7, 8.3.C Driver Ballast – Each driver ballasted to 80 kg (176 lbs)				
6.7.B – Common Ballast				
Driver Weight / Ballast Weight (driver weight includes driving clothes and shoes but not helmet)				
Color Tag / Security Marker				
7.3.F.5 Roll Cage – 50 mm clearance b/w roll cage and helmet, 30 mm clearance b/w padding & helmet				
6.6 Egress no wheel chocks, unassisted – 10 sec fully out of solar car (primary), 15 sec (secondary),	P S	P S	P S	P S

6.4.A Visibility – eye height = must be 700 mm or greater				
6.4.B Forward Vision - ground @ 8 m, 17° up, 100° side to side, 40 mm letters @ 3m				
6.4.E Rear Vision - 15 m back, 30° L/R single reflex image				
6.4.E Rear Vision – camera fixed in position, view screen viewable in normal driving position				
Appendix H. Driver Training – not mandatory, but review with team				

Regulation	**Grade**	**Comments**
8.1 Driver Req. - There are a min. of 2 drivers / max. of 4		
8.3.A Driver Helmets – Meets or exceeds Snell M95 / DOT / ISO motorcycle		
8.3.E Water/Fluids – plan for water/fluid provision (1L min)		
9.5, 8.4.A Radios/Communication – Driver in radio contact with team, hands free		
8.4.B Cell Phone in solar car – hand's free and fixed mounting		
6.7.E Ballast Access – located in solar car, and visible		
6.7.D Common Ballast Box – Equipped and sealable?		

Station Manager:

_____

Entrance:

All drivers report with ballast material, helmet(s), proper driver/passenger uniforms with fully assembled solar car and radio communication

Station Grade:

Green = Pass
Blue = Pass / Penalty / Bridging Document Required
Yellow = Needs improvement / Dynamic Test Ready
Red = Fail / Safety Hazard

TEAM:	**#**

Regulation	**Grade**	**Comments**
Lighting / Signals		
6.2.A.3 Lighting – brake; red, visible 30° L/R, 15° U at 30 m, 40% of vehicle width from CL, no farther forward than 175 mm		
6.2.A.4 Lighting – brake; red, visible 30° L/R, 15° U at 30 m, high mounted rear of vehicle canopy (700 mm above ground)		
6.2.A.3 Lighting – rear turn; red/amber, visible 30° L/R, 15° U at 30 m, 25% of vehicle width from CL, rear extremities		
6.2.A.1 Lighting – front turn; amber, visible 30° L/R, 15° U at 30 m, 25% of vehicle width from CL, front extremities, no farther back than 175 mm		
6.2.A.2 Lighting – Side Marker, amber, visible 60° F/B, 15° U at 30 m, between 20-30% back		
6.2.D. – Front turn, Side Markers, Rear Turn – Emergency Hazard format		
6.3 Horn – sound level b/w 75-102 dB @ 15 m, permanently mounted, steering wheel operated. Duration for 5 min potential		
Graphics and Dimensions		
3.10.A Solar Car Numbers – approved color, 50 mm background, 250 mm high, 120 mm wide, 40 mm brush stroke, 25 mm spacing, visible from 3 m at 1.8 m above ground		
3.10.B Institution Name – displayed on car with approved abbreviations and more prominent than any team sponsor logo/name, no disruptive or offensive graphics. Visible from 3 m at 1.8 m above ground		
3.10.C Event Logo –space (200 mm H x 300 mm W) on both sides, visible from 3 m at 1.8 m above ground		
3.10.D. National Flag – displayed on both sides of car by windshield (min size 70 mm x 40 mm)		
6.1 Solar Car Dimensions – Max. Dimensions L = 5.0 m, W = 1.8 m, H = 1.8 m		
6.1.B Rayce Configuration – body remains fixed (no reorientation/tilting) when moving under its own power		
6.1.A Charging Configuration – solar car body may split into two components; each component may not exceed the dimensions of the assembled car		
8.3 Number of Occupants – Max. of (1)		

Cockpit		
7.3.B Seating Position – driver head above and behind feet. 27 degree or less, solid base & back rest		
7.3.C Belly Pan – full isolation and ability to support 80 kg. Driver above lower element of chassis		
7.3.F.4 Padding – roll cage padded around head meeting SFI-45.1 or better		
7.3.F.4 Headrest – headrest provided with 20 mm thick padding, secured		
6.5 Outside Air Circulation – cockpit vents / intake vents, fan if from wheel vents		
6.6.B Egress – Can be opened from both inside and outside, No tape used at egress point		
6.6.F Egress Opening – 25 mm wide stripe, and external canopy release marked "Open" 20 mm		
6.4.C & 6.4.D Windshield – shatter resistant, method to clear rain, distortion free		
Raycing Requirements		
7.8 Towing Hardpoint and tow strap for breakdowns per track regs		
6.8 Data logger – position for exposure to sky and fixed in position		
Vehicle Weight and Tires		
Vehicle Weight **LF -** **RF-** **LR-** **RR-** **Total:**		
7.2.A Tire Sets – tire configurations meet loading requirement, min 3 points of contact		
7.2.C Tire Ratings – weight <wheel rating> tires inflated w/in manf. rating tube-type tires need tubes		
7.2.D. Wheel/Rim – profile matches bread requirements of tire		
Tire Set Configuration NOTES:		

Solar Array Sizing		
5.2.A Cell Type: _____		
5.2.B. Array Size (Cell Types 1 and 2 - 6m^2 , Cell Types 3A and 3B as per equation, Cell Type 4 – 3m^2)		
3.3.F Solar Cell Technology – Solar cells match information given on approval form		
5.2.D Example Cell and map provided that match physical array on car		
5.2.C No more than 6 cell types or sizes used		
5.2.F Grandfathered Array		
5.12 Water Sprayer – hand pumped, 5 gal max, ambient temp water only		

Station Manager:

_____

Entrance:

Driver in fully assembled solar car

Station Grade:

Green = Pass
Blue = Pass / Penalty / Bridging Document Required
Yellow = Needs improvement / Dynamic Test Ready
Red = Fail / Safety Hazard

TEAM:	**#**

Regulation	**Grade**	**Comments**
5.1 Power – Solar array is present, no non-solar power sources		
5.3.A Battery Max weights _____ Pb-acid sealed (125 kg) _____ NiMH (60 kg) _____$LiFePo_4$ (40 kg) _____ Li-ion / Li Polymer (20 kg) _____ 5.3.B. (Other)		
5.5.D Battery Ventilation – 280 L/min pull from exterior vent, operates with battery switch Fan can operate from supplemental if BPS trips		
5.5.E External Cooling – not permitted unless powered by main battery / unless emergency		
5.5.A, 5.5.C Battery Enclosures – isolated w/ 1 MΩ to frame, non-conductive, labeled		
5.7.B External Cutoff Switch – properly marked and rated for load		
5.11 Electrical Shock Hazards – protected and marked w/ 10 mm labels		
5.3.D, 5.3.B Other Storage Techniques – Power condensers or flywheels		
5.5 & 9.12.C Battery Removal – batteries can be removed and have appropriate storage case		
3.3.D & 5.3 Storage Batteries – match submitted approval form		
5.3 Battery Pack Weight		
5.5.B Battery Mounting - secured		
5.3.C Supplemental Batteries – radios, meters, telemetry, driver fan, main disconnect relay, horn only		
5.6 Main Fuse - < 200% Ip or 75% of wire capacity, first in series		
5.7 Power Switch – manual switch capable to interrupt Ip, 10 mm labels, normally open		
5.8.B Electrical Connection – between array and car are carried internally		
5.8.A Cable Sizing – proper size for Ip		
5.9 Accelerator – zero return, brake shutoff on cruise control		
5.10 Control – driver has sole control		

Station Manager:

_____

Entrance:

Fully assembled car

Station Grade:

Green = Pass
Blue = Pass / Penalty / Bridging Document Required
Yellow = Needs improvement / Dynamic Test Ready
Red = Fail / Safety Hazard

TEAM: **#**

BATTERY PROTECTION SYSTEM OVER VOLTAGE (OV) TEST

☐ String ☐ Module ☐ Cell – Test Level ☐ Pass ☐ Fail

Nominal Voltage: _____ Vnom @ ___ °C
Max Voltage: _____ Vmax @ ___ °C
BPS Max Trip: _____ Vmax_trip
☐ Filtering ☐ Delay

BPS V Resolution: _____ Bit
BPS V Range: _____-_____ VDC
BPS Sample Rate: _____ S/s
BPS Disconnect Delay: ___ s

BATTERY PROTECTION SYSTEM UNDER VOLTAGE (UV) TEST

☐ String ☐ Module ☐ Cell – Test Level ☐ Pass ☐ N/A ☐ Fail

Nominal Voltage: _____ Vnom @ ___ °C
Min Voltage: _____ Vmin @ ___ °C
BPS Min Trip: _____ Vmin_trip
☐ Filtering ☐ Delay

BPS V Resolution: _____ Bit
BPS V Range: _____-_____ VDC
BPS Sample Rate: _____ S/s
BPS Disconnect Delay: ___ s

BATTERY PROTECTION SYSTEM OVER CURRENT (OC) TEST

☐ String ☐ Module – Test Level ☐ Pass ☐ N/A ☐ Fail

Max Current: _____ Imax @ _ _ °C

BPS I Trip: _____ Imax_trip
☐ Filtering ☐ Delay

BPS I Resolution: _____ Bit
BPS I Range: _____-_____ VDC
BPS Sample Rate: _____ S/s
BPS Disconnect Delay: ____ s

BATTERY PROTECTION SYSTEM OVER TEMPERATURE OT) TEST

☐ String ☐ Module ☐ Cell – Test Level ☐ Pass ☐ N/A ☐ Fail

Max Operating Temperature: _____ °C

BPS T Trip: _____°C Tmax_trip

BPS T Resolution: _____ Bit
BPS T Range: _____-_____ °C
BPS Sample Rate: _____ S/s
BPS Disconnect Delay: _____ s

Station Manager:

_____

Entrance:

Fully assembled car / battery pack and BPS

Station Grade:

Green = Pass
Blue = Pass / Penalty / Bridging Document Required
Yellow = Needs improvement / Dynamic Test Ready
Red = Fail / Safety Hazard

TEAM:	**#**

Regulation	**Grade**	**Comments**
3.3.B Structural Report – Vehicle matches structural report		
5.5.B Battery Enclosures – structurally sound and properly secured to chassis		
6.7.C Ballast Carrier – structurally sound and properly secured to chassis, no more than 2		
7.4.D Buckles & Straps – no nylon luggage straps.		
7.1 Body panels and array – securely fastened to prevent unintended movement		
7.1.C. Array Attachment – lanyards (braided steel 2mm dia. up to 1 m of slack)		
7.1.A Covers and Shields – all moving parts protected against contact. Driver shielded from steering linkage and other moving parts		
7.1.B Clearance – moving parts are interference free		
7.1.B Steering Static Test – can turn lock to lock while still, no excessive play in steering		
7.2.B Wheels – Wheels meet the minimum requirements		
7.3 Driver cockpit – designed for protection, will not cause undue strain		
7.3.D Safety Belts – commercial 5 pt. that meets SFI 16.1 or SFI 16.5, proper positioning of attachment points, properly attached with nuts and bolts		
7.3.E.1 – Crush Zone – 150 mm structural zone by driver torso		
7.3.F Roll Cage – designed to encompass driver in all directions, integral part of chassis		
7.7.A Steering Wheel – continuous perimeter steering wheel. Ref. Appendix A		
7.7.B Steering stops – in place and functional		
7.5.D & 7.5.E, 5.9A Pedal Placement - brake pedal activation, spacing between pedals, right foot activation		
7.5.F Hand Brakes – if equipped – lock-to-lock use without repositioning hands		

7.5 Brakes – dual independent and balanced co-reactive		
7.5.A Brake Pads – contact area > 6.0 cm^2, initial thickness >= 6.0 mm, full contact with rotor		
7.5.C Brake Lines – appropriately sized and constructed		
7.6 Parking Brake – lockable, independent equipped with working parking brake (must hold 10% of vehicle weight in both directions), non-tire contact style, >6.0cm^2 area		VEHICLE WEIGHT = FORWARD PULL: REAR PULL:

Critical Areas (Reg 7.4.E)	Steering	Brakes	Front Suspension	Rear Suspension	Seat/Safety Harness	Drive Train	Battery Box	Ballast Box
7.4 - Critical Areas do not use friction or press fit assemblies								
7.4.A Bolts – SAE grade 5, M 8.8 or AN/MS on critical systems, two threads beyond nut, no shaved heads								
7.4.B Securing Bolts – safety wire, cotter pins or flex-loc nuts								
Fastener/Hardware Notes:								
7.4.C Securing Rod-Ends – All rod-ends secured with jam nuts								

Station Manager: _____

Entrance:

Vehicle disassembled in team pit

Station Grade:

Green = Pass
Blue = Pass / Penalty / Bridging Document Required
Yellow = Needs improvement / Dynamic Test Ready
Red = Fail / Safety Hazard

TEAM:	**#**

Regulation	**Grade**	**Comments**
U-Turn Test		
7.7.C Turning Radius – any portion of the car <200 mm above ground is within 16 m wide lane		RIGHT TURN: LEFT TURN:
Figure-8 Test		
7.2.A Tire and Wheel Requirements – all wheels must remain on the ground		
7.1.B no body work shall contact moving structural members		
7.9 Dynamic Stability – vehicles must exhibit sufficient stability during test		
7.9.A Figure 8 – vehicle must negotiate figure-8 course in less than 9 seconds per side w/o hitting cones or showing signs of instability		TIME FOR FIGURE-8:
Braking Test		
7.9 Dynamic Stability – vehicles must exhibit sufficient stability during test		
7.5.B, 7.9.D Braking Performance – vehicle must decelerate from >= 50 km/h (31 mph) at > 4.72 m/s^2 to a complete stop w/o excessive veering or signs of instability (mechanical braking only)		TIME: SPEED:
Three-Wheel Cars with Rear Brake		
7.5.G Performance – hold car with fr. Wheels elevated, dry pavement, forward pull >=15% of weight		**VEHICLE WEIGHT =** **FORWARD PULL:**
7.5.G.2 Volume Limiting Value – not permitted		
Slalom Test		
7.9 Dynamic Stability – vehicles must exhibit sufficient stability during test		
7.9.C Slalom Test – Negotiate slalom course within appropriate time (11.5 s)		TIME: SPEED:
High Speed Stability		
7.9 Dynamic Stability – vehicles must exhibit sufficient stability during test		
7.9.B Stability at Speed – Maintains constant speed in a 3.5 meter lane		SPEED:

Station Manager:

_____

Entrance:

All drivers report to station with car, Green, Blue, or Yellow from Body & Sizing, Electrical, Mechanical, and Driver/Passenger Stations with radio communication

Station Grade:

Green = Pass
Blue = Pass / Penalty / Bridging Document Required
Yellow = Not available at this station
Red = Fail / Safety Hazard