

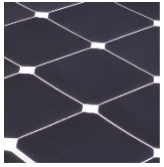


AMERICAN SOLAR CHALLENGE 2016



# ASC FUTURE REGULATIONS

Greg Thompson  
August 6, 2016



# ASC FUTURE REGULATIONS – FORM OF CAR

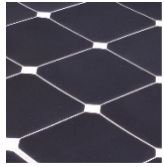
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4 wheels (2 front, 2 rear, symmetrical layout along mechanical centerline)

Front, rear track  $> 0.5 \times$  total width

Max Size 5m x 2.2m x 1.6m (Lg, W, H)

Min Eye height 0.7m (no change)



# ASC FUTURE REGULATIONS - ARRAY

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4 m<sup>2</sup> arrays for Silicon cells, 3.56 m<sup>2</sup> arrays for thin film GaAs, 2.64 m<sup>2</sup> for multi-junction

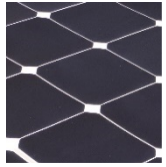
Concentrators, reflectors, lenses allowed but aperture area can not exceed the base area above

Cell areas not limited by % efficiency (i.e. no approved list)

Provision for supplementary panels 1-2 m<sup>2</sup> carried in the car (exact amount is TBD)

No array re-configuration while driving

Array stand carried in the car (hand tools that do not become structure excepted)



# ASC FUTURE REGULATIONS - BATTERIES

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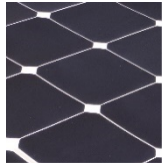
Batteries (Li-S = 15 kg, Li-Ion = 20 kg, Li-poly = 20 kg,  $\text{LiFePO}_4$  = 40 kg)

Max 2 battery boxes (TBD)

Maintain BPS

Stricter restrictions on what is on supplementary batteries (TBD) – WSC does not allow the same amount of kit on the supplementary battery (only timer, ROM, tire pressure monitors – battery up to 2 kWh)

Safe State (TBD)



# ASC FUTURE REGULATIONS – DRIVER

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Occupant cell designed to protect driver from injury – more details forthcoming

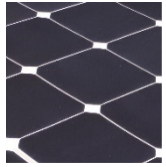
Heels below hip point

Driver position open (i.e. does not need to be on CL) – must face forward  $\pm 10$  deg

Seat angle definition revision

Angle between shoulders, hips and knees  $> 90$  deg

Ballast within 300 mm of hip point



# ASC FUTURE REGULATIONS – BODY

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Lights - generally same as our current, some position changes and viewing angles revisited

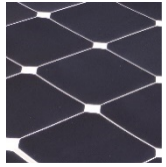
Potential headlights

Horn - WSC requires 105 dB at 2m – may revisit our requirement

Driver feedback – speed, lights activated, hazards, bps strobe feedback, rear vision

Labels – Adding front signage area of 600 mm x 150 mm (flat area projected onto the car)

Will maintain bi-lateral egress



# ASC FUTURE REGULATIONS – MECHANICAL

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Potential 4 wheel braking (WSC requirement – may adopt for ASC 2020 – not a requirement for ASC 2018)

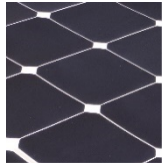
Seat belt anchorages have minimum force requirements

Steering columns must be designed to not spear the driver

Must be able to reverse

Roll Cage equivalency to steel, metallic (no composite)





# ASC FUTURE REGULATIONS - CRUISER

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History – Calgary attended FSGP 2015 – participated alongside Challenger cars. Treated in parallel to Challenger cars

Minnesota attended ASC 2016 – also participated alongside Challenger cars. Treated in parallel to Challenger cars.

For full integration – need to operate as a separate class with results based on energy efficiency equation. This is the method that WSC does. However; the stage start/stop, checkpoint timing complicates this.

We can revise to have the Cruisers work on an ASC specific energy equation and participate in a separate class.

May also include some form of practicality judging (i.e. parallel parking, cargo carrying capability, etc).

Challenges is similar to what we have faced before with separate classes (i.e. 1 or 2 cars entering, also focus in media is on the first across the line)