

REPORTS & REPORT WRITING

Suzanne & Michael Royce
Albion Associates LLC

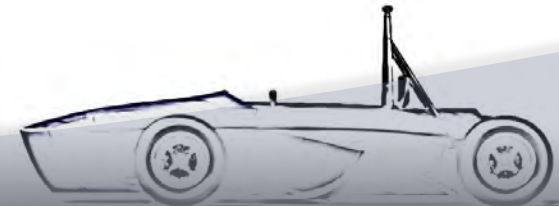
Agenda

- List of reports
- Submission dates, typical
- Penalties
- Report formats
- Considerations on all reports
- Special requirements & tips
 - Design Report & Design Spec Sheet
 - Impact Attenuator Data Report
 - Cost Report



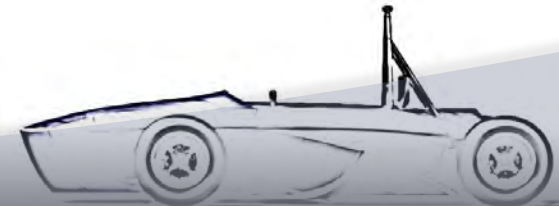
Reports & Submissions

- All Competitions require:
 - S6.2, Design Report
 - S6.3, Design Spec Sheet
 - T3.22, Impact Attenuator Data Report
 - T3.9, SES (Structural Equivalency Form)
 - or SRCF (Structural Requirement Certification Form) for AFR,
 - except AFR not accepted for Formula Hybrid or FS UK
 - Fuel Order (Except FSAE EV)
 - Program Information



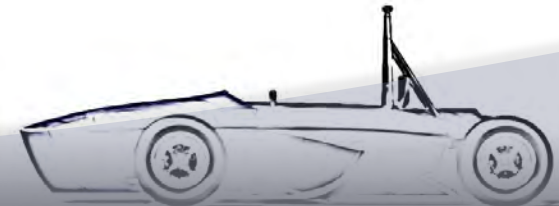
Reports & Submissions – cont'd

- Formula SAE & Formula Student also require:
 - S3, Business Logic Plan
 - S4, Cost Report, hard copy & electronic copies required.
 - S4.17, Cost Report Addendum (at the Competition)



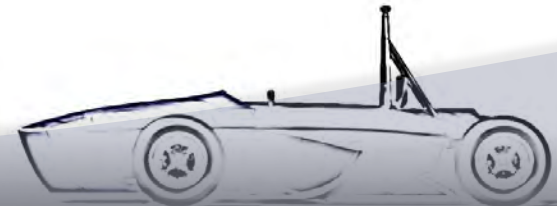
Reports & Submissions – cont'd

- FSAE EV & Formula Hybrid also:
 - EV9.1, Electrical Systems Form
 - EV9.2, Failure Modes & Effects Analysis Electrical
- FSAE EV Only:
 - A5, Electrical Systems Officer & Electrical Systems Advisor Form(?)
 - IC1.17, Notice of Intent to Use ETC.
 - IC1.18, ETC FMEA (ETC can now also be used for FSAE IC cars)
- Formula Hybrid Only:
 - S3.2.1, Project Management Plan
 - S3.2.2, Project Management Interim Report
 - S4.2.2, Sustainability Report



Submission Dates

- The dates are critical!!
- A8.2 (FSAE) and A9.2.1 (Formula Hybrid) say “No exceptions!”
- The dates vary by competition
- Get from the competition’s web site



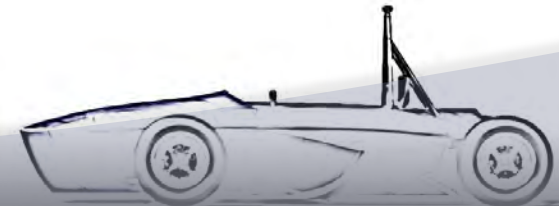
Typical Submission Dates

Rule No.	Item	Due Prior to Competition, Typical
AF1.4	Notice of Intent to Build to Alt. Frame Rules (AFR)	26 weeks
IC1.17	Notice of Intent to Use ETC	26 weeks
EV9.2	Electrical FMEA	20 weeks
S3	Business Logic Plan	17 weeks
IC1.18	ETC FMEA	15 weeks
EV9.1	Electrical Systems Form/Electrical Safety Form	15 weeks
T3.9	Structural Equivalency Spreadsheet (SES)	14 weeks
AF2	Structural Requirements Compliance Form (SRCF)	14 weeks
S3.2.1	Project Management Plan (Formula Hybrid Only)	13 weeks
S6.2	Design Report	10 weeks
S6.3	Design Spec Sheet	10 weeks
T3.22	Impact Attenuator Data Report	10 weeks
S3.2.2	Project Management interim Report (Formula Hybrid)	10 weeks
S4	Cost Report (not Formula Hybrid)	6 weeks
	Fuel Type Request	6 weeks
	Program Information	6 weeks
S4.2.2	Sustainability Report (Formula Hybrid)	4 weeks
Appendix S-5	Cost Report Addendum	At competition
A5.2 & A5.3	Electrical System Officer & Electrical System Advisor (ESO & ESA)	



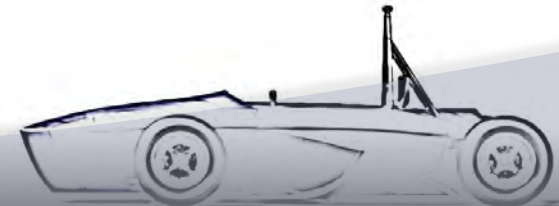
Penalties

- Basically 10 points per day or part thereof.
- Many reports capped at 50 points deduction max.
- Except
 - The Design Event
 - Capped at 100 points penalty
 - After 10 days late, non participation in the Design Event
 - The Cost Report
 - Penalty capped at 80 points max. –
 - After 15 days classed as “Not Submitted”
 - Not submitted = 100 points penalty and not participate in the Cost Event.
 - Can end up with negative points for the Cost Event!!
- **But**



Penalties – cont'd

- New Rule A.8.4.1 Failure to submit the required Business Logic Case, Cost, Design or Technical documents within 10 days of the deadline **will constitute an automatic withdrawal of your team.** Your team will be notified after the 9th day of no submission that we have not received your documents and after 10 days your team's registration will be cancelled and **no refund will be given. This elimination will take place after each round of required document deadlines.**



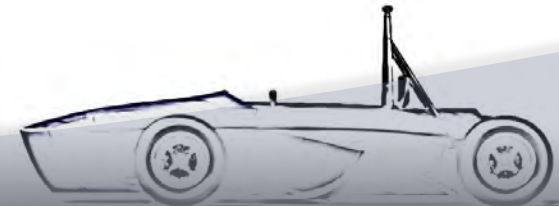
Report Formats

- May be required as electronic, or “hard copy”, or both
- Need to know which format(s) is required
- Check the competition web site
- A number of reports have specified formats or templates
- Don't alter specified templates, especially the Cost Report BOM and the Design Spec Sheet!



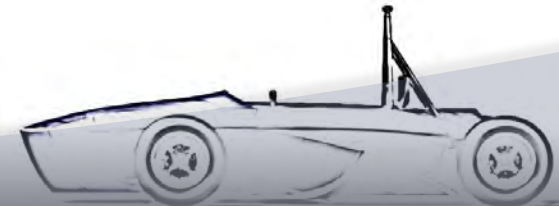
Important Considerations for All Reports

- Do not change the format or template if it is given
- Judges have to read many reports, some up to 100-120 pages
- There may be a limit on the number of words or pages, e.g. the Design Report
- Judges will read the first specified number of pages and ignore the rest
- Brief & concise, you are not writing a book
- Write in the third person not the first
- SI (the MKS, metres, kilograms, seconds) units preferred
- Don't use tiny type – some judges have old eyes
 - Check the font type & font size requirements



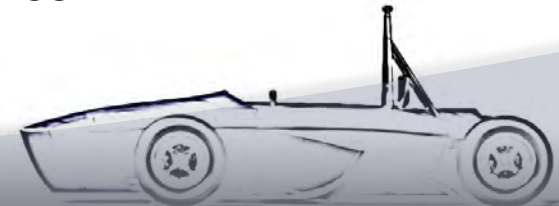
The Design Report & Design Spec Sheet

- S6.2.4 These documents will be used by the judges to sort teams into the appropriate design groups based on the quality of their review.
- Also, they are the first impressions of your car.
- Therefore, important to do a good job.



The Design Report

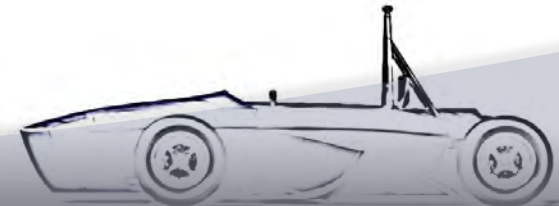
- 8 pages maximum.
 - 4 maximum of text
 - A title page counts as 1 page, so do NOT use!
 - 3 pages of drawings (top, front and side)
 - Each drawing on a separate page
 - Drawings, NOT sketches or photos
 - Bodywork removed, if possible
 - 1 optional for photos, graphs, etc.
 - Any photos should be placed here. They will not be counted as drawings
 - See “Three View Drawing Excellence” at <http://students.sae.org/cds/formulaseries/rules/>



Three View Drawing Excellence says

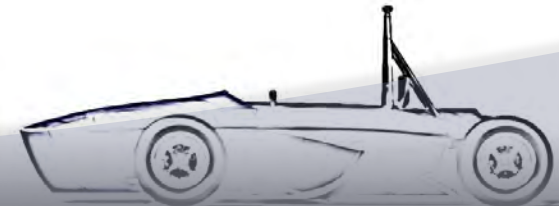
The drawings:

- Must be line drawings. No shaded, photorealistic, rendered images, or photos will be considered. (This is per the rules)
- Must be printed on three separate pages. (Also per the rules)
- Should include some basic dimensions. (Overall Length, Width, Track Width, Wheelbase, Height, etc., just to name a few)
- Should include a title block, but a **school name** and **car number** somewhere on each page will suffice. Car names or school mascot names are not helpful, and should not appear.



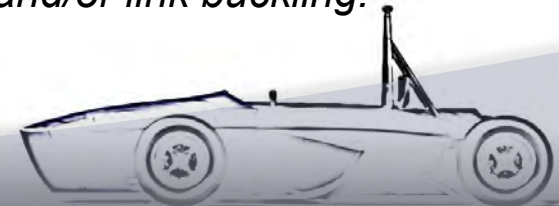
Design Spec Sheet

- Download the template
- Do NOT change or re-format the template
- SI/MKS units much preferred
- If you don't have data from testing, use best estimates
- Submit electronically with, but separate from, the Design Report



Impact Attenuator Data Report

- Must use the official template for 2015
 - Even if you use the Standard FSAE Impact Attenuator
- Do NOT change or re-format the template
- *The calculations of how the reported absorbed energy, average deceleration, and peak deceleration figures have been derived from the test data MUST be included in the report and appended to the report template.*
- Options if using a Front Wing
 - a. Physical testing of the Impact Attenuator Assembly with wing mounts, links, vertical plates, and a structural representation of the aerofoil section to determine the peak force. See fsaeonline.com FAQs for an example of the structure to be included in the test.
 - b. *Combine the peak force from physical testing of the Impact Attenuator Assembly with the wing mount failure load calculated from fastener shear and/or link buckling.*
 - c. *Combine the Standard Impact Attenuator peak load of 95kN with the wing mount failure load calculated from fastener shear and/or link buckling.*



Impact Attenuator Data Report

Common Errors are not understanding the basic dynamic equations and Newton's Second Law:

- There are three basic equations that apply irrespective of the mass, method of test, or whatever. They are:

$$v^2 - u^2 = 2.a.s \text{ and}$$

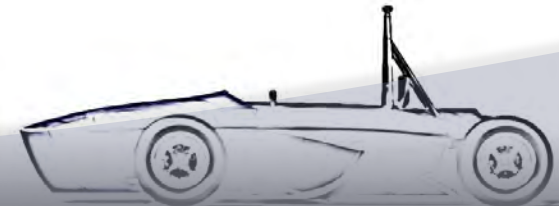
$$v - u = a.t$$

$$F = m.a$$

where u = initial velocity, v = final velocity, a = acceleration, s = distance, t = time,

F = Force and m = mass

- To meet the 20g average decel requirement, the IA cannot be shorter than 124.9 mm long!
- To meet the Peak Decel Requirement of 40g, the Force exerted by the IA cannot exceed 117.7 kN!
- Not adjusting the recorded decel numbers if the test was done with a mass other than 300 kg.



Cost Report

- Start on the BOM at the start of the design process
- Each design engineer should be responsible for his/her parts & section
- Download the BOM template
- Do NOT change or re-format the template
- MUST include EVERY part of the car
 - Missing parts or undercounted parts will bring penalties
- Submit “hard” and electronic copies
- Don’t miss the submission date
- The one event where you can end up with negative points!!



Questions?





Copyright © 2015 Albion Associates, LLC.

All rights reserved.

