



GENERAL AVIATION (GA) & ELECTRIC PROPULSION

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GA seminar

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➤ **GA & Electric Propulsion**

➤ **Certified glider**

- **Lange E1 Antares, certified on 14-Jul-2006**
- **Lange EA 42 (electric motor), certified under CS-22, Subpart H**
- **Sportine Aviacija LAK-17B FES, certified on 31-Oct-2014**
- **FES-LAK-100M (motor accepted as part of the aircraft)**

➤ **On going certification E-FAN**

- **Lots of discussions and pre-application meetings**
- **ASTM F2480(-14), which is in force via CS-LSA**



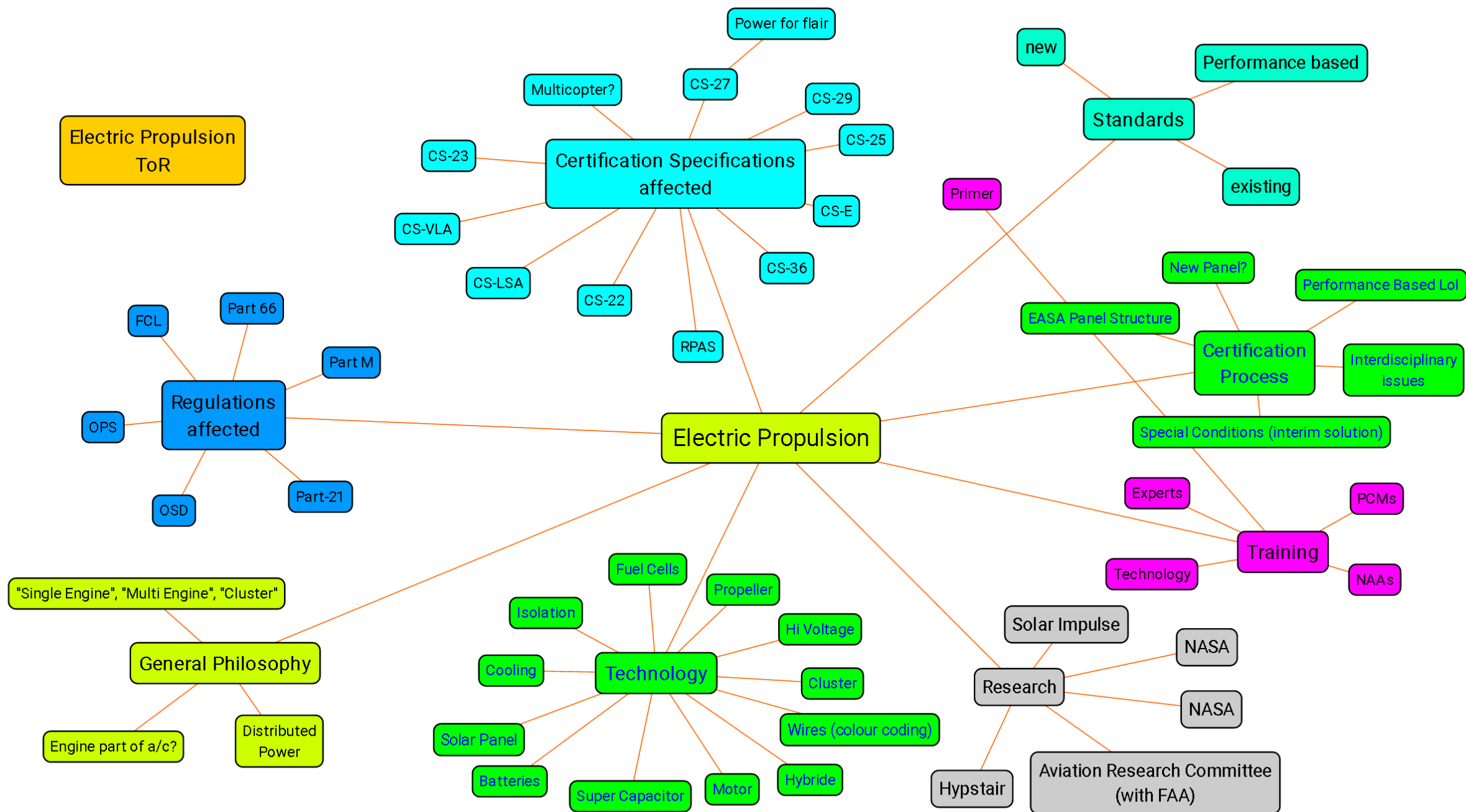
➤ **Outlook:**

- Electric/ hybrid propulsion in GA is clearly developing far further and quicker:
 - Experimental aircraft
 - Microlight
 - Unmanned Aircraft
 - Long term strategy Boeing and Airbus for regional airliner from 2032 onwards
- Allows for a sustainable and environmentally friendly GA
- Promise to be an economical means for different operations
- Synergies automotive and aviation
- Significant amount of research
- There are challenges ahead (e.g. battery technology, controller of motor and battery, energy supply, ...)



➤ **EASA's participation**

- EASA is highly committed to support electric/ hybrid propulsion
 - Increasing internal expertise and resources
 - Developing adapted specifications, standards, and guidance
 - Intensive coordination with, and support to industry
- Proposed to extend the MTOM of Microlights in Annex II when using electric propulsion however no mutual recognition
- In parallel simplify procedures for certification to CS-LSA which already allows for electric propulsion and with mutual recognition
- New, re-organized Certification Specification CS-23
- Initiated coordination for adaptation of Part 66; OPS and FCL:
 - TOR for comprehensive rulemaking task by end of the year
- Working further (currently) on Special Conditions for CS-23





➤ **Some thoughts about Electric Propulsion**

➤ Rules (examples)

- SEP licence (single engine piston) → which way do we want to go in future?
- B2 → Electric propulsion links electric with powerplant, do we need a separate field?
- 30 / 45 Minutes reserve → indication of available power, discharge completely?

➤ Certification Specifications, technical items

- Software for motor control → how to certify?
- Free running propeller → how to stop an propeller if the engine is out of order
- High voltage → isolation monitoring, fault current sensing, protection (rescue), ...
- High energy batteries having all on board for a fire → to be considered as fire zone?
- Generator runaway for hybrid systems
- Master Switch Arrangement
- Bat shut-off,...

➤ Standards

- What kind of associations or standards are we looking for? (SAE, EUROCAE, ASTM, ...)



Thank you for your attention
Comments and questions are
welcome

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