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Introduction to eVTOL Design and Certification

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Introduction to eVTOL Design and Certification

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23 August 2022

Airworthiness Engineering and Management Research Cluster

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Civil Aviation Legislation

- In 1944, during the WWII, 52 countries assembled in Chicago to discuss international flight navigation.
- The resolutions during the meeting the resolutions were recorded and published into articles, Chicago Convention Articles.
- Nowadays, these articles are published in the ICAO Doc 7300
- These articles are supported by Standards and Recommended Practices (SARPs), which are published into 19 Annexes.
- The SARPs will be the ICAO members states basis of their aviation laws.
- In Malaysia, the SARPs was brought in through the Civil AViation Act 1969.
- The Civil AViation Act 1969, Section 3 given the power to the Minister to write regulations to take effect the Chicago Convention 1944.
- The Minister then wrote the Malaysia Civil Aviation Regulations (MCAR) 2016.
- The Regulations in the MCAR 2016 further amplify by the Directives issued by the CEO of the CAAM under the power of the Civil Aviation Act 1969, Section 24o.
- The non-compliance to the Directives will face similar punishment to the non-compliance to the Acts and Regulations.

Aircraft Design

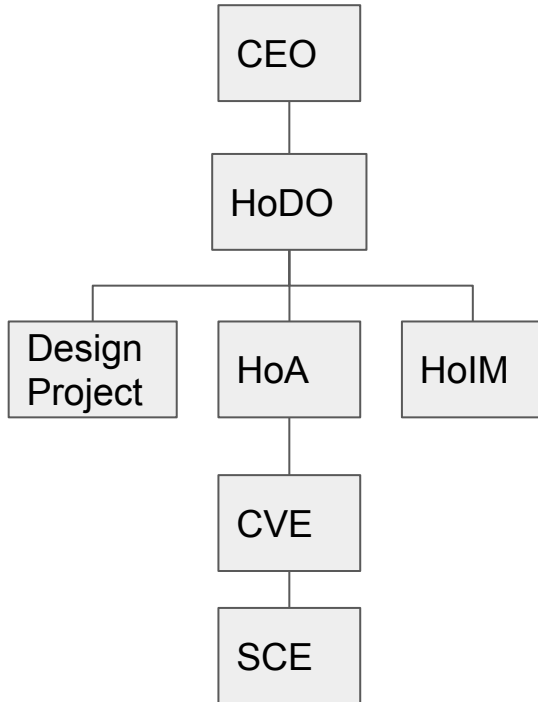
- The MCAR 2016, Regulation 21 requires that “anyone intended to design or designing and manufacturing of an aircraft or aeronautical products must have the approval from the CEO of CAAM”.
- The MCAR 2016, Regulation 25 allows the used airworthiness codes of the ICAO contracting states.
- The CAAM CAD 8 “Airworthiness of Aircraft” details the TC, PC, Continuing Airworthiness and design requirements of the aircraft.
- These the TC, PC and C of A process further amplify in the CAD Part 21 Subpart B (TC and RTC), Subpart D (Mod), E (STC), G (POA), H (C of A), Subpart I (noise), Subpart J (DOA), Subpart K (appliances), Subpart M (repair), Subpart O (TSO), Subpart P (PtF), Subpart Q (Part Numbering), and etc.

Design Organization Approval

- The MCAR 2016, Regulations 21 requires approval from the CEO.
- The application must be from DOA, CAAM CAD Part 21 Subpart J.
- In parallel, the applicant may also apply for the POA, Part 21 Subpart G.
- The DOA must be a legitimate company, having a valid registration with the ROC.
- The company must have CEO, HoDO, HoA and HoM as post holders.
- These post holders will need to pass the CAAM interview.
- The CEO must not be technical person, his responsibility to provide resources for the operation of the company under the approval.
- However, if the CEO is a technical person, he may also hold HoDO post.
- The application for the DOA must be accompanied by a DOM
- The process of approval requires at 3 stages; review of manual, audit, and closing all the non compliances
- Once satisfied, the CAAM will issue provisional approval.

Condition for Approval

- Organization



- The technical staff with sufficient experience and adequate numbers.
- Access to facilities to build prototype, testing.

Application for DOA approval

- Fill up form
- Pay fee
- Choose scope of approval

Activities

- The participants have to develop the;
 - Organization Chart
 - Develop the draft manuals (use the anybody's manual template)
 - Man-hour planning
 - Suppliers control procedures (access to facilities)
 - Fill up forms
 - Choose scope of approval

Application for RTC

- Apply for RTC iaw CAAM CAD Part 21 Subpart B
- The RTC is for application, when there is no direct design requirement in the ICAO Annex 8 / CAAM CAD 8
- The applicant and CAAM will have to discuss for the detail of the design requirement

