

# Manufacturing and modifications of components for an electric DragonFly Airplane

Manufacturing of airplane components and perform modifications to the structure for electric flights.

The Aeronautical Engineering department at Inholland University of Applied Sciences in Delft embarks on a project to get a Viking Dragonfly mk.II in the air. The goal is to utilise new technologies which currently are still in development by the industry to significantly lower the emission for aviation.

***“Project DragonFly is completing the build of an existing Viking DragonFly mk.II while transforming the airplane into a cleaner, quieter and smarter solution.”***

The Dragonfly was given the Outstanding New Design Award at the EAA Convention in 1980 [1]. This airplane features a tandem wing layout and is mainly constructed from composites.

For more information about Project DragonFly, visit <http://projectdragonfly.nl>.



## Project description

The next step in the roadmap is to manufacture components of the primary structure and perform modifications such that an electric propulsion system can be implemented. The research activities will vary from literature research to design, build and test airplane components such as an aileron and instrument panel.

The methodologies to manufacture the components are described in the building manual of the DragonFly, which is defined in 1980. The main focus is to validate whether these manufacturing procedures still meet the regulations of today. As a result, airplane components may have to be redesigned, manufactured and tested.



Besides manufacturing new components, modifications on the airplane its primary structure shall be performed. The DragonFly is going to fly using electric propulsion to lower the carbon emissions in the industry. Hence, the structure shall be modified to implement batteries as a power source for the electric motor. The structural integrity must always be taken into account while designing and implementing structural modifications to guarantee safe flights.

The following research activities are expected:

- Perform literature research on relevant strategies for composites manufacturing and repairs;
- Design, built and test an airplane component to validate the manufacturing procedures (described in 1980) in terms of structural integrity related to contemporary regulations;
- Design a strategy for the structural modifications of the DragonFly, to implement an electric propulsion system, while taking structural integrity into account;
- Prove that the design is suitable for implementation and implement the modifications in practice on the DragonFly.

### **Company information**

Inholland Composites, located at Inholland in Delft and Alkmaar, is a very well equipped, high-tech laboratory in the field of composite materials and structures. The focus is on fibre reinforced plastics which provide durable and lightweight solutions in a wide range of applications. In addition, Inholland Composites is spreading their wings to contribute to a sustainable aviation being cleaner, quieter and smarter. It is our mission to put theory into practice and provide students with up-to-date education which connects to today's business.

Would you like to join forces and contribute to a sustainable aviation? Sent your application (motivation and CV) to [mark.ommert@inholland.nl](mailto:mark.ommert@inholland.nl).

Internship period: February 2020 / June 2020

Assignment written by: Mark Ommert

Checked by: Arnold Koetje