FAI ENVIRONMENTAL COMMISSION NEWSLETTER

APRIL 2015

The FAI Environmental Commission has been acting quietly for years, considering and preparing advice for all sporting and recreational aviators. The original challenge was to provide the basics for establishing a code, a presence on the FAI website and setting up standards for air sports environmentally friendly activities.

When these tasks were completed, one might think that EnvC just has to wait for some opportunities to arise to speak of birds and flowers alongside our beautiful flying sites.

It may not be the case.

In a world where the Environment is one of the most talked about topics, where everybody has become conscious of the impacts of human activities on resources and nature, as well as on other human beings, it would be foolish for air sports to forget what the impact of our activities is and how our own environment reacts to our actions and behaviour.

Therefore, the EnvC has to act and communicate in order to prepare the future of Air Sports, which must lie in a better integration with non-flying people and activities. Air Sports commissions have the unique and fantastic goal of making people dream about all kind of flight through competition and training. The Environmental Commission, with other support groups within the FAI and the National Aero Clubs, has a mission to make sure that air sport remains possible, through the development of rules and guidance showing how to respect the public and our prized asset: nature.

To show what can be done in this respect, we have decided to produce this quarterly newsletter, giving condensed information about existing actions and plans pertaining to this mission.

We hope you'll enjoy these short pieces of hands-on examples or descriptions of challenging projects, which show the direction of the way ahead.

Please forward this to everyone you know in the aviation community, to give them the additional clues about what the future looks like in our fantastic world of sport aviation.

Pierre Duval

President, FAI Environmental Commission

Green events in the air…and on the ground!

The Green AirSport Event certification for FAI events is coming soon! In our next newsletter all necessary information will be provided to help organizers to take actions for sustainability in air sports.

Until then, enjoy this report on two of the Hungarian National Gliding Championships, organized as green events!

Even if we hear more and more about climate change, CO_2 emissions, environmental protection and sustainability, it is hard to realise how meetings, sport events, festivals and conferences have significant negative effects on the environment. These effects can be minimized and prevented with professional hard working, diligence and care taken by the organizers.

In 2011 and 2012 the Hungarian National Gliding Championships were organized as green events. *In response to the major challenges of the 21st century and, following the trends of our time, the two week contests became green events, with the aim of setting an example to the competitors, teams and all visitors, and promoting sustainable consumption and lifestyles in air sports.*

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Why should a gliding competition be a green event?

First of all, because gliding is one of the sports bringing people very close to nature. Who can tell, besides glider pilots, that they had flown hundreds of kilometers, at high speed in full harmony with nature, along with storks and eagles, using only the energy of the Sun?

The aim of the two week gliding contest is to achieve the highest average speeds on the longest distances using only the energy of the Sun. This already positions this activity as a "renewable energy based sport".

From an environmental point of view, at a gliding contest it is not the racing itself that has significant negative effects, but the services around it: moving and towing the gliders, the needs of the visitors and teams, and the camping activities. Taking care of our environment, conscious behaviour is mainly just a matter of attitude.

What made the contests green?

Usually when organizing a green event the following areas should be considered as the sources of negative environmental effects: waste management, water use, energy consumption, transport and procurement. So these were in the focus of greening by the two national championships as well. However it should be highlighted, that green events have awareness raising effects, when the organizers have the opportunity to give information and show solutions to the participants on sustainable lifestyles.

Transport: car sharing service to and from Őcsény, two electric cars were provided by a sponsor. One of them was a solar charged prototype and they were used for taking the gliders to the grid and from the runway.

Water consumption: due to technical burdens, reducing water consumption was up to the users of the camping facilities. All the showers and taps were equipped with 4 minute sand glasses and funny awareness raising infos. They were one of the most popular tools used.

Waste management: in cooperation with the local waste company, containers for selective waste collection were placed around the camping, with information boards.

Green procurement: the organizers purchased all the products needed taking into account environmental aspects, and provided solely eco-labelled goods for the participants' use at the facilities (soap, toilet paper, paper towels) and for the cleaning team as well.

Awareness raising: at the beginning of the contest there was a "green briefing" and a "green bulletin" was issued as well to inform every participant about the things the organizers had done (green procurement, information etc.), and about what they were being asked to do (water saving, selective waste collection).

The ensuing questionnaire about the quality of the event and about the experiences resulted in surprisingly positive feedback and constructive suggestions on how to do even better "green nationals"!

Power grid in Germany: a major side effect on airfields

The expansion of renewable energies makes high demands on the German power grid and requires its expansion. Since the energy isn´t produced where it´s used, the supply to customers is delivered via large power lines. These are mainly overhead lines, as they use less space, they are easier to service and much cheaper to build than underground cabling. Airfields and clubs will certainly be affected by the route of several thousand meters long power lines creating real barriers to flying activities. Although during the first phase of the project, the airfields themselves were taken into account, the necessary airspace around them for safe operations was not,

Picture: Uschi Kirsch (DAeC)

therefore the energy carrier companies now have to correct the plans. The German Aero Club is actively involved in the process by supporting them with data provision. Hence the clubs can be protected in a better way.

Habitat airfield

Picture: Michael Pütsch (BfN)

Only a relatively small part of the entire airfield surface, runways and taxiways are used intensively. The large safety areas next to them are kept open. Normally there´s no fertilization on airfields or issuance of pesticide and the soil isn´t ploughed up. In the security area, mowing may be limited to once or twice a year.

Often an airfield is lined with hedges or populated with groups of trees. Today most airports offer a stable habitat that has been virtually unchanged for decades, for a variety of plants and animals, including endangered species.

Because of the little use that air sports make of the ground, habitats and species are protected. Otherwise they could have been reconstructed or destroyed.

Especially in agriculturally used areas, airfields offer habitats which have become rare in the environment.

Therefore airfields are highly valuable assets for habitat preservation because of air sports and care.

Denise Kluge*, Referat Umwelt und Natur, Deutscher Aero Club e.V.* D.Kluge@daec.de

How could helicopter flying add to aircraft safety and environmentally correct action on agriculture?

Sergey Ananov, *Russian Air Sports Federation, Helicopter pilot*. robinson664422@gmail.com

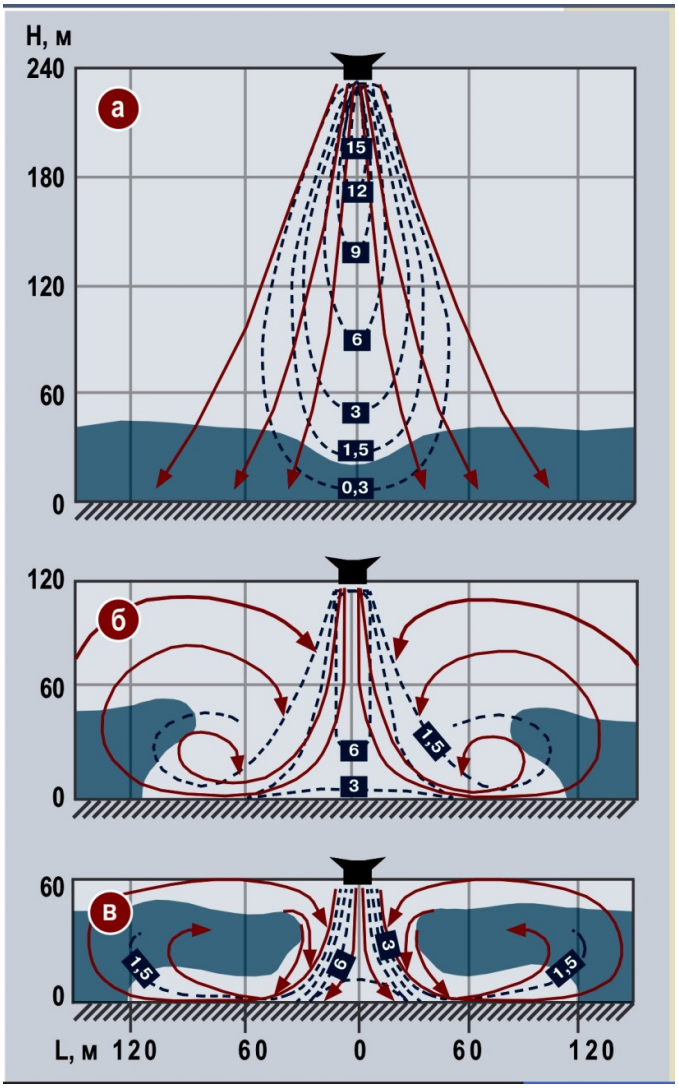
Using helicopters as antifreeze

Often temperature behaviour is not fair for agricultural crops development. Generally, a cold snap is due to surface inversion because of radiation cooling. Temperature falls often result in plants dying. The helicopter method of fighting against frosts and frost operations over winter crops (which is especially urgent in Russia) has a number of advantages. Firstly, it is highly flexible, depends little on wind changes and helps to iron out temperature falls on large surfaces. Secondly, this method turns out to be ecologically cleaner than smoke-screens. Traditional methods of fighting frosts which are fumigation and screening with smoke lead to large amounts of aerosols, soot, smoke and other harmful matters being emitted into the atmosphere.

While hovering, a helicopter disturbs a layer up to 200-300 m (600-1000 ft), and horizontally a zone 10 times more than the rotor diameter. At the top of the disturbed layer the temperature falls if an inversion occurs, and at its bottom the temperature rises. It is recommended that helicopters should be used when humidity is more than 85% and the temperature lower than -15°C. In this case a cloud cover emerges behind a helicopter, which reduces frost operations and leads to the ground layer temperature rising by 8-10°C.

… and as an anti-fog "ventilator" too

The helicopter rotor looks like a flexible ventilator with a power unit. It has turned out to be helpful in resolving some safety and ecological problems. One of them is dispersing fog over runways to ensure safe landing of planes. This method is effective while dispersing radiation fog of shallow thickness, up to around 100 m (328 ft). It can replace highly fuel-consuming processes consisting of burning nozzles around runways in countries where temperature and humidity are such that fog is a common issue. This action requires that the helicopter is based in a place nearby where fog is not a factor, which, depending on local geography, may not be easy to find.



The pictures on the left show air currents while a helicopter is hovering at various heights. The best hover height to disperse fog (120 m) can be seen at the picture in the middle. It shows that intensive downbursts reach the ground while ascending air is considerably weakened. In their turn, horizontal streams provoke particle movement and collision, and particles can then grow and fall out. Certainly, the height of 120 m is not always appropriate. It depends to a large extent on the helicopter's characteristics, weather and landscape.

For instance, a wet ground surface reduces this efficacy and even leads to the opposite outcome.

The helicopter flight has to be carried out above the inversion coverage. This is the only situation when descending dry air is far from its saturation point and, mixing with saturated air, disperses fog. When the appropriate height is less than the inversion thickness and the flight is carried out below its top edge, then the fog is unlikely to be dispersed. In any case of fog dispersal, its thickness must be less than the flight height.

Crossing the Atlantic the electric way!

Pierre Duval, *President of Regulation, Safety & Environment, Aeroclub de France* – pierreduval@wanadoo.fr

Apart from the most famous Solar Impulse, 2 projects are on their way for the first Green Energy powered flight between New York and Paris in order to re-enact Lindbergh's famous flight in a 21st century manner.

ERAOLE from Ocean Vital foundation (www.fondationoceanvital.com) plans to make its maiden flight this coming summer with a 750 kg home-build incorporating both solar cells in a specific fabric over the 4 wings and an microalgae fuel powered engine to supply electricity to the engine through hydrogen cells.

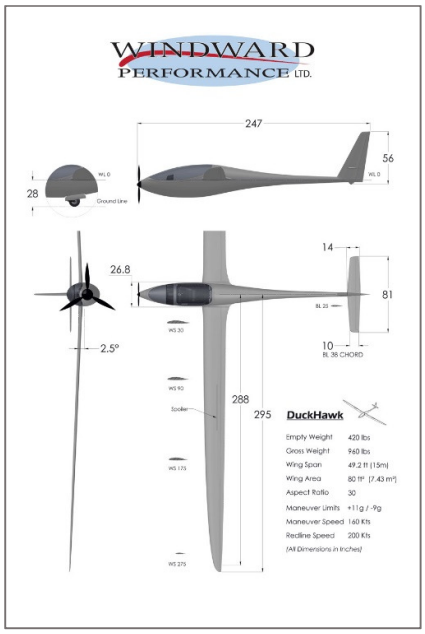
Hence, the flight should be the result of both powered (25% solar and 75% algae juice) and gliding virtuosity making the best use of sun and winds, hopefully in the coming autumn season or spring 2016.

This may seems challenging as 43m² of solar cells do not provide for a lot of power compared to the needs of an airplane, but for such an optimized flight, any power won from the outside is important.

Just as with Solar Impulse, the goal is not to design a "usable" aircraft but to show a proof of concept with all idea to be developed for the next attempt.

ERAOLE project from Fondation Ocean Vital

The second project, Etlantic, is a battery powered ultralight proposed by AeroSkyLux from Luxemburg.



This aircraft (www.etlantic.com), looking more like a glider than a typical aircraft, follows a first prototype dedicated to the testing of the complex management of such power. Nothing can be really off the shelf for such a project, and technological partners like SAFT batteries, ONERA (French space lab), Arplast (propeller), WATT Consulting and the like are trying to act as real pioneers in such a challenging field.

Electric power reignites the flame for new challenges in air sports and this is only one fantastic side of a new era. The challenge to explorers, designers, engineers and pilots for finding new ways of flying with less environmental cost is of the same magnitude as that which the early pioneers had to overcome.

There are plenty of initiatives around electric powered aircraft, and the big guys entered the field thought noticeable prototypes: Airbus has first helped electrifying the small MC10 Cricri twin engine home-build, before investing in the E-Fan twin electric fans two seater presented at 2013 Le Bourget Air Show. Now, Airbus works through its subsidiary VoltAir on a coming 2 seat full electric trainer in the LSA category (E-Fan 2.0) and the 4 seater (E-Fan 4.0) with hybrid propulsion.

Boeing linked with researchers from the University of Cambridge, for successfully testing the first aircraft to be powered by a parallel hybrid-electric propulsion system, where an electric motor and gasoline engine work together to drive the propeller.

Europe is for now the place to be for this kind of testing when seing the number of companies developping their solutions, although China makes steps ahead by certifying the full electric Rui Xiang RX1E two seats trainer.

In the next issue of the newsletter, we'll tell more about low and clean energy applied to another challenging area: aerobatics.

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