

Preventing air accidents

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Collisions between light aircraft and helicopters and high voltage cables, wind turbines, high-rise buildings, oil platforms and telephony masts are all too frequent. Credit: Øyvind Nordsahl Næss.

A Norwegian satellite-based system aims to ensure that helicopters and light aircraft are prevented from colliding with power lines and other obstacles.

Collisions between light aircraft and helicopters and high voltage cables, wind turbines, high-rise buildings, oil platforms and telephony masts are all too frequent. A small company from Snåsa called NobileSoft is aiming to solve this problem. Founder and helicopter pilot Jan Ivar Sandnes put together the company's first prototype as early as in 2009 in collaboration with the utility company Nord-Trøndelag Elektrisitetsverk (NTE). Sandnes has always believed that a GPS-based system was

needed to do the job. He has now joined forces with SINTEF and other partners such as Statnett, and Energy Norway, and the NTE has made sure that work on the project is accelerated.

Unsatisfactory

Collisions with overhead [power lines](#) alone account for 10 per cent of aviation accidents in Norway. As well as the loss of human life, such accidents have cost the Norwegian Air Force more than NOK 500 million during a 15-year period.

To date, the most important warnings pilots receive as they approach a hazardous obstacle have been orange balloons or lights. Many have argued that existing warnings are unsatisfactory, and many accidents involve collisions with obstacles not covered by statutory regulations. In conditions of poor visibility or blinding by intense light, a pilot may fail to see an obstacle before it's too late.

Conflicts over OCAS

The idea of warning [light aircraft](#) and helicopters using a GPS-based system represents an alternative technology to an earlier collision avoidance system (OCAS) which has been used in many locations in Norway, the USA and Canada. OCAS is based on a mast equipped with radar technology located close to the obstacle, and which transmits a warning signal to the pilot on a given radio frequency.

OCAS got the thumbs down following a proposal for new statutory regulations put forward by the Norwegian Civil Aviation Authority in 2009. The owners of various overhead power grids would have been compelled to purchase the system, and this triggered a mass of protests due to its high cost. The fact that the two founders were former fighter

pilots and the Norwegian Armed Forces were sponsoring the system only made things worse. Consultation statements, media coverage and the surrounding hype forced the Aviation Authority to withdraw the proposal. The founders have since withdrawn from OCAS and new owners have arrived on the scene. Today, OCAS installations have problems maintaining operation due to a lack of spare parts.

Simple and inexpensive

Jan Ivar Sandnes at NobileSoft tells Gemini that the aim of his company now is to develop a commercial version of the new system. Since the project continues to face technical and research-related challenges, a public sector research and development contract (OFU) has been entered into with Innovation Norway.

"There is great interest in this project from overseas, and now that we have research expertise and experience backing it up, it would be very interesting to establish a multinational consortium to promote the system in the global market," says Sandnes.

Entire value chain

Business developer Trond Bakken at SINTEF ICT tells us that the challenges have changed since the system's launch in 2009.

"Technological and market developments have combined to resolve many of the challenges linked to the project, and we can now focus on the core issue of data quality," says Bakken. "The challenge lies in the acquisition, quality assurance and distribution of all the data now in the possession of the various 'grid owners' distributed across Norway", he adds. "These data, relating to geographical position, cables and their heights, are both inaccurate and available in a variety of formats," says

Bakken.

In fact, there are several thousand cables and grids scattered around the country. Statnett owns the most extensive grid systems, and then there is a group of regional grid operators (often municipal), and finally some locally-based, private owners.

ICT researchers have put forward a proposal for a system architecture which takes the entire value chain into account. All elements have been defined – from the grid owners to the user, and how communication will function between the two.

Provided by SINTEF

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