

Up, up and AWAY!

Richard Gauchwin reports on how one enterprising individual got an aerial survey business off the ground and delivering high quality imagery in just eight weeks

Nestled just below the turrets of Caernarfon Castle in North Wales is Panorama, a gallery owned by professional, multi-disciplined photographer, Geraint Thomas. While providing a wide range of services from landscape prints of Snowdonia to commercial shots for brochures, posters and websites, Geraint's speciality is energy infrastructure photography. Most recently, he has been producing a range of digital media for UK energy company Horizon Nuclear Power, a Panorama client for over six years.

Horizon Nuclear Power develops new generation nuclear power stations and its lead site, Wylfa Newydd, is located on the Isle of Anglesey and adjacent to the former Magnox Wylfa Power Station (now being decommissioned). The company also has a second site on the banks of the Severn Estuary near Oldbury in South Gloucestershire.

At 1500 acres, the Wylfa Newydd site, which aims to provide up to 850 permanent jobs, is the biggest infrastructure project ever undertaken in Wales and one of the largest in Europe. However, due to its complexity and size, Horizon Nuclear Power was having difficulty in sourcing a UAV photogrammetry surveyor to chart its development. The company therefore approached Geraint with a brief to gauge his interest in taking on the project. This initial approach was made over Christmas 2017, with a requirement for the first aerial survey to be completed by the end of February 2018.

Flight planning

Following some initial research, Geraint was confident that he could deliver the required data, but he was also aware that with just two months to conduct and deliver his first survey, he would have to move quickly. Initially, time was saved because Horizon Nuclear Power had specified the UAV that they felt would be best suited to fulfil their data requirements on such a large site. In this case it was senseFly's eBee Plus RTK fixed wing platform together with Pix4D processing software.

This decision was based on the eBee's survey-grade accuracy, its long flight times and battery life which would facilitate flying on such a large site. Another attraction was its ability to fly in winds of up to 40kmh, vital for a coastal location on the edge of the Irish Sea. Horizon Nuclear Power was also aware that the eBee Plus RTK had been used successfully on similar projects of this size.

Geraint therefore contacted senseFly distributor, KOREC, which could not only supply an eBee Plus RTK at short notice but also organise a complete training package covering both product training and pilot accreditation through its CAA-authorised partner, Drone Pilot Academy (DPA). A package of this sort meant that Geraint had just one point of contact at KOREC throughout the whole training process and who was able to organise it in the shortest timeframe possible.

Push back

Following the purchase of his eBee on the Wednesday, Geraint was booked into the three-day accreditation course and exam on the following Wednesday and returned the next week for the practical which he also supplemented with a DPA UAV surveyor's one-day course. Finally, he had one day of KOREC product training.

Geraint explains, "The training process was thorough and I was rigorously prepared for the exam by the DPA. Every detail was covered and they also assisted with the production of my operations manual, double checking everything to ensure that it was spot on before submitting it on my behalf. To further my knowledge, I additionally attended the DPA's one-day UAV surveying course which was ideal for the applications I was planning to undertake and gave me a heads up on some of the issues I may come across. Finally, I had

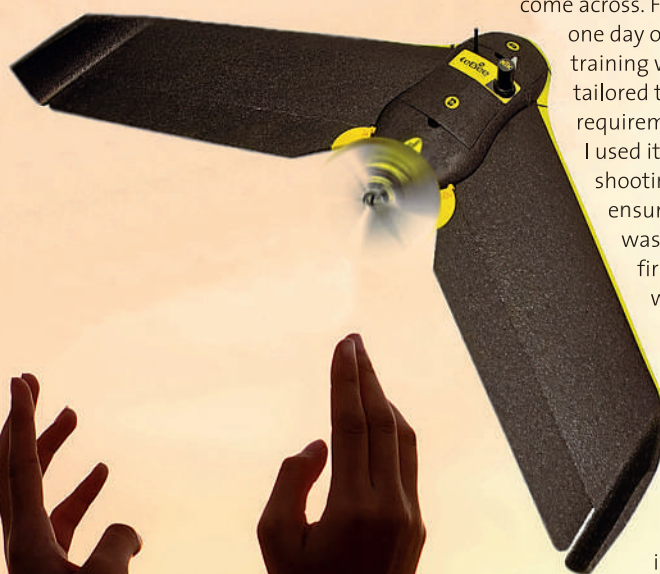
one day of eBee product training which KOREC tailored to my particular requirements and in fact I used it as a trouble shooting exercise to ensure that everything was in place for my first flight. The whole process was seamlessly organised and all the training was of excellent quality."

CAA accreditation is finalised seven weeks after the exam is passed and

during this time KOREC supported Geraint on his early flights with its own CAA accredited pilot.

Taxi and line-up

The Wylfa Newydd development site covers 1500 acres and Geraint was

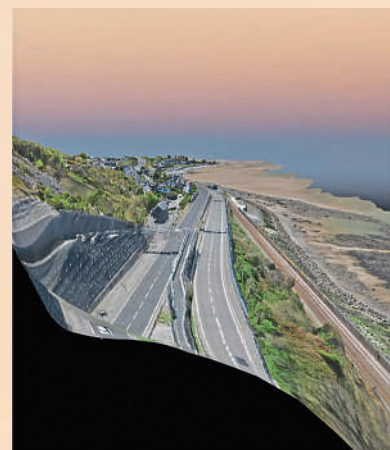
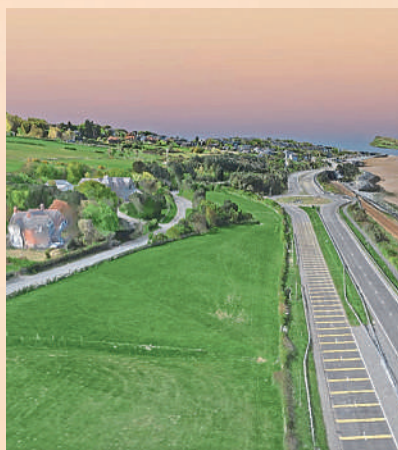


TIMELINE: CREATING A SUCCESSFUL AERIAL BUSINESS FROM SCRATCH

- Week 1** Purchase of SenseFly eBee Plus RTK
- Week 2** Three-day training course and exam for CAA accreditation with the DPA
- Week 3** Practical with the DPA for CAA accreditation; Additional DPS UAV surveyor's Course; One day of product training with KOREC
- Week 5** First flights undertaken with guidance from KOREC CAA accredited UAV pilot
- Week 7** CAA accreditation comes through
- Week 8** Successful flights and delivery of high quality aerial imagery to client



Above: Preparing for the first flight in Anglesey (Geraint, left) Below: Examples of the high quality of data captured by the eBee Plus RTK at Wylfa Newydd and adjacent coastal area



contracted to carry out quarterly surveys of the whole area moving to monthly flights when earthworks were begun.

KOREC ensured that UAV experts was on hand to assist with everything, from the flight planning (taking into account land access, weather conditions and any adjustments to the flight plan due to changes in take-off and landing points) to a CAA exemption license that was required for the site, as well as supporting Geraint in the field for the two days of work.

On the first day, ground control was established with KOREC's help using a Trimble R10 GNSS tying-in to existing features such as the corner of road markings. Although Geraint had opted for an eBee Plus RTK, there are times when there is no mobile signal, especially in more remote areas, and therefore the Trimble VRS Now real-time correction service can't be accessed. In these cases, the data needs to be post-processed back at the office.

Take-off

Both flying days were wind-free with perfect

lighting conditions, all of which enabled Geraint to conduct his 12 planned flights of around 40 minutes duration. He also took the opportunity to fly additional areas along coastal cliff edges which he initially thought would have to be left until the summer. Every flight went to plan, even in the fading late-afternoon light.

As soon as the data was collected, Geraint loaded all the images in the Pix4D processing software and the resultant data was presented to the client's GIS team in two coordinate systems, all within seven days of the flights. The deliverables included the DSM and orthoTiff contours.

Geraint found both senseFly's eMotion3 flight planning package and the Pix4D software easy to learn, with all the features he required and none of the complications. However, it was the quality of the data supplied by the eBee that really impressed him. "I knew there was a huge buzz about the data within hours of the files becoming available. Heads of department met for a working lunch to discuss the emerging possibilities, and although the original

request for aerial surveys came from the GIS team, other departments - from design to archaeology to contracts - could see its value, even referring to it as 'game changing data'!"

Flying high

Geraint continues, "There's no doubt that news of these successful flights has spread beyond Horizon Nuclear Power and I'm already being approached by new clients. For me, investing in an eBee Plus RTK has been like buying a business-in-a-box, but I can't stress enough how good training and support is what makes the whole thing work. Both the Drone Pilot Academy and KOREC have been exemplary in this."

His concluding thought: "Within two months, I've made a move from supplying my client with just site photography to highly sophisticated UAV photogrammetry. There's no doubt that the learning curve has been steep ... but the potential is immense!"

Richard Gauchwin is Business Area Manager for Mapping and GIS with KOREC Group (<https://www.korecgroup.com>), with thanks to Geraint Thomas.