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Case Study

Project Location: Stromness – Orkney - Scotland

Client: EMEC European Marine Energy Research Centre

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Project Description

The west coast of Orkney benefits from the worst of the North Atlantic's storms and serves as an excellent site for testing wave energy devices as it experiences some of the largest waves found any where in Northern Europe. Because of this it is the home of the European Marine Energy Research Centre (EMEC) which is at the forefront of the development of marine based renewables – technologies that generate electricity for homes and businesses by harnessing the power of waves and tidal streams.



Wave energy devices are attached to sub sea hookup points through which the power and test data generated is transferred to the substation on the shore. This data allows developers to test the ability and efficiency of their devices. But it is not just the engineering data that is required, before any full scale deployment can be considered an environmental impact assessment must be carried out to assess what impact the installation will have on the local environment and the wildlife that may encounter the devices whether this be a Puffin or a Whale.



EMEC approached Outersight to design long range, high resolution observation system that would enable the identification of a seabird at a distance of up to 3 kilometres. Automated archiving was also to be provided to enable a record of activity within the test range through out the year. The system would also have to cope with some of the strongest winds and harshest weather of any coastal location in Europe. The camera was to be installed at the former Coastguard lookout building where there was already



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power and a single mode fibre optic link back to the EMEC offices. As there was already a camera located within the shelter of the building we had to locate the new camera on the concrete roof of the lookout.

After careful consideration of the system requirements and budget available we opted for an ethernet enabled 5 Megapixel camera unit couples with a 32 x Megapixel lens from Fujinon. This provided realtime streaming images with a resolution of approximately 2500 x 1900 pixels which is nearly 4 x the resolution of a standard broadcast TV image and provided an equivalent of a 100 x optical zoom when compared to normal camera systems. The camera was housed in a very heavy duty enclosure built onto a Pan and tilt mechanism to enable the camera to cover the entirety of the test range. Modifications were made to the PT unit to minimise vibration and a stainless steel windbreak was designed to reduce the wind load on the camera.

Navigating at such high magnification can be very disorientating so we included a second wide angle camera which is viewed on the second display screen to allow the user to see an overview of where the camera is pointed. This screen also shows positioning data from the PT unit which is very useful for exact positioning. The images are transmitted back to the EMEC offices via Single mode fibre where they are viewed on a high power graphics dual screen workstation with a large hard disc for archiving the still and video images from the camera. These archives can then be used for manual or automated processing.



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