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## Case Study

**Project Location:** Razende Bol Sandbank – Texel - Netherlands

**Client:** IMARES (Institute for Marine Resources & Ecosystem Studies)

**Date:** July 2008

### Project Description

The Razende Bol Sandbank lies to the West of the Island of Texel on the North Sea Coast of Holland. It is a haul out for both Grey and Common seals and its tidal nature makes it an ideal feeding ground for numerous species of seabirds. Its exposed location (even in the summer, force 9 gales are not unusual) makes this a fairly hostile marine environment.

IMARES was tasked with assessing if the activity at the nearby military shooting range had any effect on the wildlife on the sandbank. For safety reasons the area has to be evacuated before any firing takes place so the traditional field observation techniques were impossible. IMARES were aware of OuterSight's other marine installations and turned to us to devise a suitable remote observation solution. The main requirements were transmission of still and live video images to the research base with remote control of the camera. Year round operation of the system was also required.

The project team at IMARES arranged for a 10 metre high pole to be sunk into the sand and on top of that was placed a small platform just 1550 mm by 900mm, which sounds larger than it actually is!

The first challenge for us was how to transmit the video and control signals to and from the pole. Initially we thought to use a digital microwave link back from the camera to the research centre but with no line of sight this would have proved unreliable. We chose a 3G telecom based system that provides enough bandwidth for low resolution live video as well as uploading still images for archive. Despite the latency involved with 3G data systems control of the camera is very



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responsive. We also included a WiFi link to the camera pole to enable configuration from a laptop on a boat which is convenient for maintenance.

Powering the system was the next problem to overcome. Usually a solar power solution would be chosen but with room on the pole for just 2 solar panels we knew that to operate through the winter, when daylight hours and strong sunshine are minimal, a hybrid system had to be devised. As wind generation was not an option due to bird strike and potential reliability issues we modified a Methanol Fuel Cell device for marine environment use. The device only works when the battery voltage drops below a certain level so is very efficient and while operating it's by products are moist, warm air with a very small amount of CO<sub>2</sub>. As the fuel cell is only required for the mid winter months the device is housed independently of the rest of the system for easy seasonal installation.

The harsh marine environment with high winds and abundance of corrosive and abrasive salt crystals demanded a robust camera unit and we chose a MIC1-400 from Forward Vision which we modified to cope with the installation site. The camera provides an 18 x optical zoom Sony 480TVL camera module in an IP68 rated pan and tilt housing with 360 degree continuous rotation. The small size of the unit and streamlined design minimises any wind induced vibration. Although in high winds the entire pole structure vibrates but this is unavoidable.

The research project is due to continue for at least another 18 months but the initial results have been very promising. The research is no longer restricted by sea states or weather conditions and a more accurate assessment of animal behaviour is achievable due to the complete absence of field researchers in the area being observed.

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