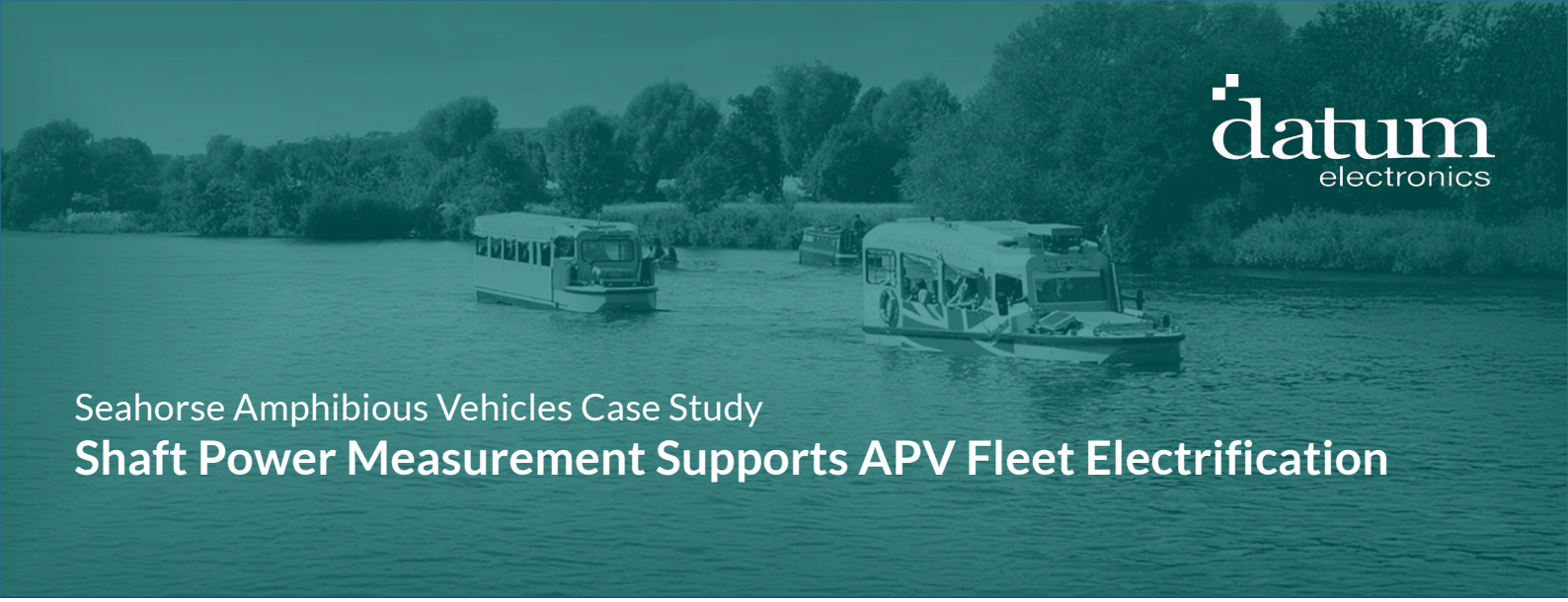

Seahorse Amphibious Vehicles Case Study

Shaft Power Measurement Supports APV Fleet Electrification

The Client

Seahorse Amphibious Vehicles

Seahorse Amphibious Vehicles was founded by marine engineer Graham Lumley in 2014 to address safety and efficiency challenges affecting the Amphibious Passenger Vehicle (APV) sector, by revolutionising the industry with innovative new vehicle designs.

In 2022, the company entered full production at a new UK-based factory, marking a significant milestone in its development. The launch of the Seahorse MKIII in the same year reinforced a focus on safety, durability, and a future-ready platform designed to support electrification.

Through its sister companies, Windsor Duck Tours and Splash Tours Liverpool, Seahorse operates established amphibious tour services, while also supplying vehicles to a growing international customer base.

The APV sector had long been reliant on Second World War–era vehicles (DUKWs) and heavily adapted donor vehicle chassis.

The Challenge

Seahorse sought to enhance their APV's performance by accurately measuring power usage during water operations. The primary objective was to gather precise power consumption data at varying speeds, which would be used to optimise the design of an electric drive system and appropriately size the battery pack.

The challenge was to determine the kilowatts per hour consumed by their existing diesel-hydraulic vehicle, where power demand can vary significantly depending on operating conditions and load.

The Solution

To support this work, Seahorse were supplied with a Datum Electronics **Shaft Power Measurement Kit** (SPMK), a portable test system designed to measure shaft torque and rotational speed directly on the driveline, allowing true shaft power to be calculated under real conditions.

This state-of-the-art equipment was used to accurately measure the rotary shaft speed of a 76 mm diameter shaft, with data transmitted wirelessly from the rotating shaft for logging and analysis during testing.

By integrating this advanced measurement technology, the Seahorse team were able to gather the critical data required for assessing and improving the energy efficiency of their vehicles.

The Datum SPMK revealed that the water jet system was operating at a significantly lower power consumption than previously estimated.

The Outcome

The data collected using the Datum SPMK revealed that the water jet system, previously estimated to consume 40 kW/h, was actually operating at a significantly lower 25 kW/h. This unexpected efficiency was instrumental in guiding the development of a new electric drive system, enabling Seahorse to design a more optimised and effective battery pack for their existing fleet.

In October of 2025, Seahorse unveiled the world's first all-electric APV, the Seahorse MKV, capable of accommodating up to 36 passengers and two crew members while running for a full day on a single charge.

These impressive new vehicles, themselves a testament to what can be achieved with years of R&D by skilled engineers in purpose-built facilities with specialist equipment, are anticipated to be coming to the Thames river in London in the near future.

Learn more about Seahorse Amphibious Vehicles at seahorseamphibious.com.

Discover the Datum SPMK and other measurement solutions at datum-electronics.com.