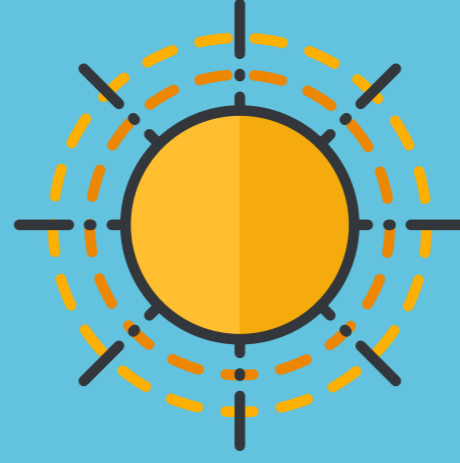


MCSA

A CONDITION



FOR WIND TURBINE RELIABILITY

MONITORING PRIMER

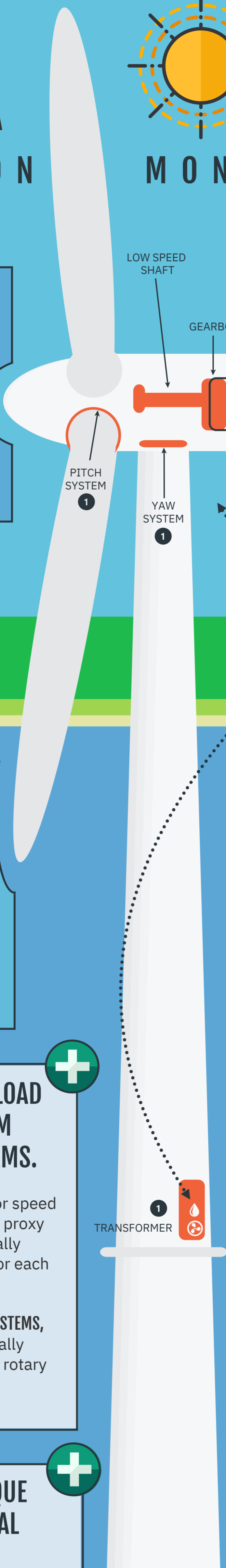
HOW IT WORKS

MOTOR CURRENT SIGNATURE ANALYSIS (MCSA) works on induction motors and generators. It's based on the observation that the current drawn by a motor (or produced by a generator) contains information about the state of both the motor and the machinery the motor is driving.

WHERE IT WORKS

MCSA can accurately monitor the dozens of **PUMPS, FANS, GEARS & BEARINGS** in a modern wind turbine with **A SINGLE 3-PHASE SENSOR PER MOTOR**.

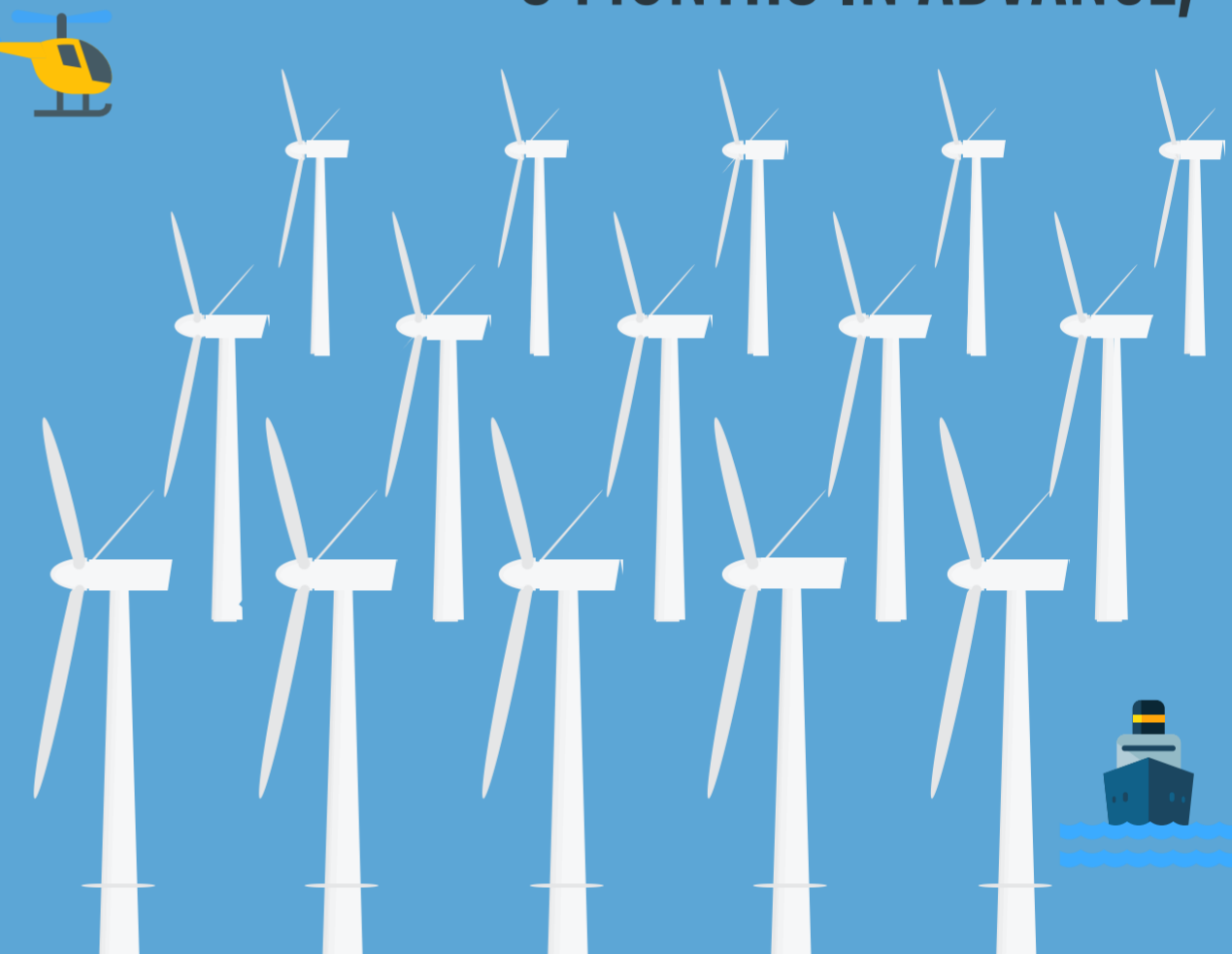
MCSA can also monitor **THE GENERATOR** and the high-speed components of **THE GEARBOX**.



MCSA + VOLTAGE SYSTEMS RELIABLY IDENTIFY MORE THAN

90%

OF DEVELOPING FAILURES UP TO 5 MONTHS IN ADVANCE,



WHICH MEANS OFFSHORE MAINTENANCE CAN BE CLUSTERED IN OPTIMALLY PLANNED WINDOWS.

Repairing faults at the predictive stage, before they grow severe enough to cause collateral damage, also **INCREASES TURBINE RELIABILITY, EFFICIENCY AND USEFUL LIFE.**

WHY IT WORKS

Each rotating piece in a system (such as a shaft bearing, pitch gear or pump impeller) has **CHARACTERISTIC FAULT FREQUENCIES** that are captured in the current drawn by the driving motor. MCSA systems use these distinct frequencies to **DETECT AND LOCALIZE BOTH MECHANICAL & ELECTRICAL FAULTS** within that single data stream.

UNPREDICTABLY VARIABLE LOAD AND SPEED ARE NO PROBLEM FOR MCSA + VOLTAGE SYSTEMS.

Because they directly measure motor speed and active power (which is a reliable proxy for load), the AI software automatically builds a model of healthy behavior for each new combination of speed and load.

CONTRAST THAT WITH VIBRATION-BASED SYSTEMS, which must integrate a computationally expensive system of tachometers or rotary encoders to acquire, process and synchronize the necessary data.

MCSA IS THE ONLY TECHNIQUE THAT CAN DETECT ELECTRICAL FAULTS WHEN THEY START.

Other systems can't see them until they manifest as mechanical damage.

MCSA + VOLTAGE IS THE ONLY CONDITION MONITORING TECHNIQUE THAT CAN PROVIDE ENERGY INSIGHTS.

It takes both current and voltage to calculate electrical efficiency.

MCSA IS INCREDIBLY EASY TO INSTALL.

Sensors install in the motor control cabinet, not on the equipment to be monitored—so you can do all the mounting and wiring to a DIN rail onshore, then plug into the MCC on-turbine. You can even configure the system for your network onshore.

SCALABLE

AI-BASED

REMOTE

24/7

THE RESULT

↑ **SAFETY**

↑ **INSIGHT**

↑ **PERFORMANCE**

↓ **O&M COST**



FOR MORE INFORMATION: semioticlabs.com/wind

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