Innovation Theme 1 – Innovative Sensing & Inspection Hardware for Long-Term Infrastructure Performance

Context

Launch Academy is seeking advanced sensing, inspection and monitoring hardware capable of delivering real-time insight into the condition of offshore wind turbines, foundations, cables and other critical infrastructure.

The UK's offshore wind sector is entering a new phase, with a growing proportion of wind farms now reaching mid-life. As assets age, operators face rising pressure to maintain reliability, extend operational life and reduce the cost and risk of manual offshore interventions. Newer offshore wind developments are learning lessons from existing assets, with developers and operators increasingly looking for robust, reliable hardware that can monitor the condition of components, turbines and subsea infrastructure in real time from the earliest stages of construction onwards, to reduce the need for manual inspections, prevent faults before they escalate and better understand the life-time potential of offshore wind assets.

Traditional inspection methods - ROV surveys, periodic manual checks and reactive maintenance - are costly, weather-dependent and often unable to detect early-stage degradation. New physical technologies that can autonomously track structural health, identify emerging faults and support predictive maintenance strategies will be essential to safeguarding long-term performance.

Launch Academy 6 invites companies to bring forward innovative technologies to address industry challenges through robust, easy-to-integrate solutions that will enhance asset integrity, reduce O&M costs and extend offshore wind farm lifespan. Areas of specific interest include:

- Vibration monitoring
- Corrosion assessment
- Cable Health

1.1 Vibration monitoring

During commissioning of offshore wind turbines, before grid connection and full data access, excessive vibrations have occurred at multiple sites. These vibrations can be caused by specific wind conditions and turbine positions, which can lead to potential damage to turbines and foundations. Due to lack of data logging during these early phases, it is extremely difficult to prove damage and pursue warranty claims.

Launch Academy seeks solutions that will enable vibration monitoring and data logging in turbines and/or foundations before power and network availability. Solutions should be compact, durable for

harsh offshore conditions, secure and easy to install. They should be able to log vibration data locally for at least 6 months, enabling future analysis and validation of potential damage.

1.2 Corrosion Assessment

Corrosion remains one of the most critical challenges in offshore structures, particularly in components such as monopiles and submerged flanges. These structural elements are constantly exposed to harsh marine environments, accelerating material degradation and threatening long-term structural integrity. Ensuring their reliability is essential not only for safety but also for minimizing operational and maintenance (O&M) costs.

Currently, the industry faces significant limitations in accurately assessing and monitoring the real-time condition of corrosion. Most assessment and monitoring strategies rely heavily on periodic manual inspections, which are costly, time-consuming, and often constrained by weather and accessibility. This reactive approach increases the risk of undetected damage, unexpected failures, and inefficient maintenance planning.

Launch Academy seeks innovative technologies that will enhance predictability of structural health through early detection of corrosion onset and real-time assessment and monitoring of progression. Solutions may include (but are not limited to) wireless sensor networks, fibre optic sensing, acoustic emission monitoring and AI-driven predictive analytics. They should detect and measure corrosion, thickness lost and potential critical points on structural steel and should have a user-friendly interface and be capable of integration into existing management platforms.

1.3 Cable Health

Subsea power cables are among the most vulnerable and costly assets in offshore wind, with failures resulting in extended outages, complex repairs and substantial financial losses. Export, array and inter-array cables are exposed to a range of degradation mechanisms - including fatigue, abrasion, thermal hotspots, joint deterioration and damage to cable protection systems - that often develop gradually and remain undetected until a critical fault occurs. Current monitoring approaches rely heavily on periodic testing, reactive fault-finding and limited operational data, offering little visibility into early-stage deterioration or installation-related risks.

Launch Academy seeks innovative technologies that enable advanced cable health monitoring and early-fault detection through continuous or near-real-time assessment of cable condition throughout installation, operation and maintenance. Potential solutions may include embedded or clamp-on sensing systems, distributed fibre-optic or electrical monitoring, smart cable protection systems, autonomous or semi-autonomous inspection tools, and analytics capable of identifying mechanical, electrical or thermal anomalies at an early stage. Solutions should be robust for subsea environments, capable of long-term deployment, and provide actionable insights that help operators detect emerging issues sooner, reduce unplanned outages and enhance the long-term reliability of offshore wind cable systems.