



Innovation Challenge 4

A system to assure the quality of service and maintenance work and the condition/welfare of human operators, through data communication and real-time decision making in a difficult to access and remote location.

Background

The OWiX initiative is supporting an innovation challenge owner in the offshore wind industry to identify transferable solutions to meet its innovation needs. Whilst not limiting the technologies from solution providers, we expect that solutions would fall into three main areas/themes:

- Digital
- Artificial Intelligence and Data Analytics
- Systems, sensors and Hardware

Such solutions could include (but not limited to) innovations from the following areas:

- Wearable and mobile devices
- Wearable human and environmental sensors
- Integration with planning and productivity software
- Human-machine interface
- Audio, video and image capture and transmission
- Geographic Information Systems (GIS)
- Long-range communications
- Data storage, processing and analysis
- Augmented reality (AR) and virtual reality (VR)
- Asset management systems

To meet the desired timescale and risks, it is preferred that the proposed solution, or the key component(s) of the solution, has been demonstrated in an industrial environment. The solution should be in line with health and safety regulations.

Solution Requirements

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| Functional Requirements | <ul style="list-style-type: none">• Solutions must be capable of in-situ capture of data (e.g. measurements, images, videos, GIS information) and making reference against a stored dataset during service and maintenance operations.• Solutions should have an option to enable real-time ('live') voice communication and data transfer link remotely to an onshore base/office.• Solutions must be operated with minimum manual handling (near hands-free operation for on-site portable equipment) while maintaining communication and data capture (e.g. video or image recording) during field work.• Solutions must be ergonomically designed and implemented for the comfort, health, safety and ease of use of human operators in confined and restricted spaces.• Solutions will ideally be a modular and flexible system with 'plug-and-play' |
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	<p>capability to accommodate differing functionality needs of human operators and working conditions.</p> <ul style="list-style-type: none"> • The acquired data must be available for further analysis after the service and maintenance operation. • Solution must not interfere with the technician safety harness equipment currently used in the field or be incorporated into the wearable system.
Technical Characteristics	<ul style="list-style-type: none"> • Solution should be as light weight as possible, ideally no more than 10kg, and in any case, must not cause any restriction on movement, nor impact on safe operations • Solutions must have proven robust voice communication and reliable data transfer capabilities over long distance in an offshore environment, or be capable of being integrated into existing private communication infrastructure. • Solutions must offer continuous remote working durations of at least 12 hours, whether from one power supply, or through easily-swappable charge packs, up to 24-hour duration desirable. Power could be through battery or other means of powering the system. • Solution must offer the ability to exchange depleted power sources for new ones and be rechargeable in a reasonable amount of time. • Solutions should readily integrate with current industry planning and productivity software. • Where feasible, solutions should be designed and built to the relevant industry standards for marine operations, however other standards from comparable industries will be considered, where appropriate.
Deployment Timescale	<ul style="list-style-type: none"> • Validation of solution: within 1 year • Field trials: within 1-2 years • Commercial implementation: within 3 years
Operating Conditions	<ul style="list-style-type: none"> • Solutions must be able to operate safely and reliably in offshore conditions of: <ul style="list-style-type: none"> ○ An ambient temperature 0-40°C ○ Heights of 100-200m from sea level ○ Distances up to 25km from shore, ideally up to 40km ○ Continuous remote working duration of 12-24 hours ○ Confined and restricted working spaces ○ Water (or splash) and salinity resistant (ideally water proof)
Cost Requirement	<ul style="list-style-type: none"> • System cost of less than £100,000, ideally less than £50,000, for a one-off prototype. • System costs should be scalable to wind farms of up to 300 turbines per farm. • Systems costs are expected to reduce once rolled-out to multiple wind farms, evidence of such economies of scale would be beneficial.

**IP and Potential
Commercial
Route**

- Existing background IP associated with a potential solution will remain with Solution Provider(s). Where any new IP generation is envisaged, it will be subject to the mutual IP agreement of the Solution Provider(s) and Innovation Challenge Owner.
- Any commercial deployment of transferred solution or newly developed solution, through licensing, joint venture, partnership or direct investment, will be subject to the commercial agreement between the Solution Provider(s) and Innovation Challenge Owner.
- Where necessary, a non-disclosure agreement (NDA) may be signed to uphold confidentiality in the engagement between the Solution Provider(s) and Innovation Challenge Owner.
- Innovate UK and KTN do not take any share of IP ownership or enter into commercial venture through the OWiX programme.