Segregation of personnel on work boats during transit: Covid-19 Innovation Challenge

Summary

The iX competition is supporting the Workboat Association and G+ members - offshore wind farm owners (the Challenger) to identify innovative solutions to solve their Covid-19 challenge. Currently workboats are severely limited in carrying capacity due to Covid-19 distancing restrictions. The Challenger is looking for solutions to increase the carrying capacity of workboats. The winning business(es) in this competition will be given a commercial opportunity to deliver their solution, and receive support from the KTN, ORE Catapult and the wider InnovateUK network.

Challenge Details

Background

Industry support for this Innovation Challenge

This Innovation Challenge is jointly sponsored by the G+ and the Workboat Association. Each organisation represents its respective members in the offshore wind and maritime workboat industries.

Representatives from each organisation will be involved in the review of submissions. G+ and the Workboat Association will give successful applicants the opportunity to present members of their organisations from across both the offshore wind and broader maritime workboat industries, in both the UK and broader global markets.

Offshore wind Operations and Maintenance

The UK is a global leader in offshore wind with around 9 Gigawatts of operational offshore wind farms in UK waters.

All offshore wind farms require ongoing Operations and Maintenance (O&M) to support the continued and optimised performance of the wind turbines, foundations and associated electrical infrastructure.

In order to undertake the various tasks associated with the inspection, maintenance and repair required for offshore wind farms, it is necessary to deploy wind turbine technicians from UK ports to the wind farm on a daily basis.

The deployment of technicians is often achieved using specialist small-to-medium sized vessels capable of providing safe transit for technicians, tools and equipment safely to the windfarm.

Crew Transfer Vessels (CTVs)

The majority of CTVs are specifically designed and built to be efficient and effective in the offshore renewable energy sector. They are usually aluminium or composite catamarans accommodating between 12 to 24 passengers. Transit speeds range mostly between 15-25 knots although some vessels have top speeds in excess of 30 knots with vessel weights ranging between 20 – 200 tonnes.

Image of a CTV making a transfer of a technician to an offshore wind turbine

In general, most CTVs are built to the UK Workboat Code (or similar local regulations) for the construction and operation of small commercial vessels, or the High Speed Offshore Service Craft Code for larger vessels carrying above 12 passengers.

In order to raise vessel stability and comfort levels, inherent to their small overall size and structure; space on board is often compromised compared to shore-side constructions or social areas.

Passenger comfort on board is a top priority as technicians need to arrive in the field feeling well before transferring. Most vessels have individual suspension seats which are designed to minimise travel fatigue and stress caused by vessel motion. The vessels also have facilities including a kitchen, television and entertainment system. Limited berths may be available for use by the crew depending on size or design scope.

The inside of a typical CTV saloon

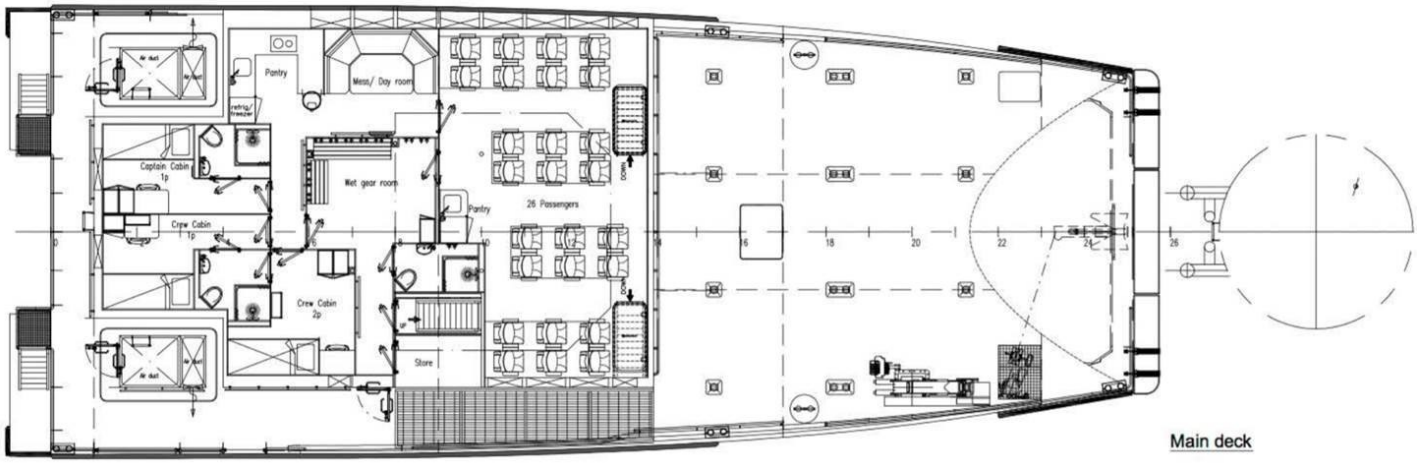
Covid-19

Like most industries, Offshore wind, and the O&M sector specifically, has been impacted by the current restrictions introduced in response to Covid-19. The first priority for all offshore wind farm owners, their suppliers and contractors is the safety and wellbeing of their teams. The offshore wind industry has responded quickly and pro-actively to the challenge presented by Covid-19 in order to prioritise continued safe operations. This has led to changes in procedures and working practices for offshore wind O&M, including the way in which CTV's operate.

On board CTVs, the technicians are typically housed in a saloon area on board the vessel, comprising seating, tables, Kitchenette and toilets. CTVs commonly have capacity to carry either 12 or 24 technicians. Due to the need to achieve social distancing of 2m to prevent potential

transmission of the virus, some CTVs are typically carrying a maximum of 4 passengers, and in specific cases, only 2 technicians at present. This reduced transit capacity has an impact on the number of technicians that can be safely deployed from shore to the wind farm, and therefore limits the inspection, maintenance and repair tasks that can be undertaken.

As short-term interim solutions, some CTV operators have experimented with measures including the introduction of perspex barriers and re-purposed fabric curtains in order to introduce some form of physical barrier to the transmission of the virus. Whilst these solutions have provided a temporary solution, there are problems with each. Perspex is a fairly brittle material, not well suited to the dynamic flexibility that is inherent in the design, manufacture and performance of CTVs. Less robust, flexible plastic or fabric materials often don't meet the durability necessary in the offshore construction and maintenance industries.



Plan view and schematic of a typical mid-large sized CTV

Innovation Challenge

As the COVID 19 restrictions in place are anticipated to move into the medium and long-term, the industry is now seeking a more robust, semi-permanent solution. This solution needs to enable a possible raise in the levels of passengers on board, back towards their designed potential, while simultaneously increasing the safety and protection of those on board.

In order to safely increase the number of technicians who can transit aboard CTVs, the sector is seeking innovative solutions for the physical segregation of technicians within the CTV saloon area. These solutions would be in line with the government guidelines on safe distancing and barriers to stop spread of infections.

While not limiting the technologies from solution providers, it is expected that solutions would consider innovations from some of the following areas:

- Construction
- Automotive
- Manufacturing
- Materials

- Composites
- Healthcare

Rewards and benefits

Successful applicants will be given an opportunity to pitch to the Challenger. The package may also include:

- Support from the ORE Catapult or the KTN
- Support in the development of a prototype or pilot
- A place in KTN or ORE Catapult events
- A potential business collaboration
- Investor introductions (if investment is required)
- Support from the Challenger to implement the chosen solution and provision of demonstration space on a workboat

Industry support for this Innovation Challenge

This Innovation Challenge is jointly sponsored by the G+ and the Workboat Association. Each organisation represents its respective members in the offshore wind and maritime workboat industries.

Workboat Association:

The Workboat Association is the trade, skills and safety standards association for the workboat industry with members and stakeholders active across the world.

Since its inception in 1994, the association has acted as a crucial point of liaison between its membership and key regulatory and industry bodies, such as the Maritime and Coastguard Agency (MCA) in the UK. It has also driven the creation of safety, technical and best practice standards, provided a unifying platform for industry lobbying and debate, and delivered industry-recognised training and certification opportunities.

Core achievements include the introduction and subsequent revision of the MCA Code of Practice for the Safe Operation of Small Workboats – the “Workboat Code,” the High Speed Offshore Service Craft Code and formation of the Workboat Apprenticeship scheme.

The Workboat Association has a membership base of over 100 UK and European workboat owners and operators, collectively representing over 600 operational vessels.

Whilst this Innovation Challenge is primarily focused on the offshore wind industry, nevertheless the Workboat Association is proud to co-sponsor the challenge and will share the results with other sub-sectors of the UK and Worldwide workboat fleet.

G+:

G+ is the global health and safety organisation, bringing together the offshore wind industry to pursue shared goals and outcomes. It is run in partnership with the Energy Institute, which provides the secretariat and supports its work.

The members of the G+ are lead operators and owners of offshore wind farms. Senior executives of the member companies meet quarterly, as the G+ Board.

The Focal Group consists of members' health and safety experts, who meet monthly to deliver the work programme of the G+. There are European and APAC Focal Groups, with consideration currently being given to creating a North American Focal Group.

Solution Requirements

Functional Requirements

In order to safely and effectively meet the specific challenge associated with segregating technicians using CTVs for transit, the following must be considered:

- **Government Guidelines:** Covid-19 Guidelines for short-term offshore work should be adhered to with any solution. They can be found at this link.
- **Durability:** Materials used to establish physical barriers should be highly durable, owing to the demanding physical environment in which they will be used. They should be capable of withstanding knocks and bumps that are commonplace in a maritime environment.
- **Fire safety:** All materials should adhere to the highest possible fire safety standards, as per specified in the UK Workboat Code, which can be found at this link. Regulations are based on the relevant underpinning statutory instruments relevant to the UK Shipping Regulations, in this specific case: the UK Merchant Shipping (Fire Protection: Small Ships) Regulations. Separation systems should also allow for ease of movement between compartments on the vessel in the event of a fire or other emergency evacuation scenario.
- **Chemical properties:** Many CTV operators are currently undertaking frequent (often daily) deep cleaning of vessels as part of revised operating procedures in response to Covid-19. Any separation system must allow for continued ease of deep-cleaning and use materials which will not react to the chemicals used for cleaning. Further information about the types of cleaning chemicals and processes used can be found at this link.
- **Air quality and ventilation:** Maintaining the air quality within segregated compartments will be important, whilst at the same time maintaining protection from Covid-19 transmission. Ideally this should be achieved without the requirement for significant power which is in limited supply aboard CTVs.

- **Weight:** Solutions should minimise the need for additional weight to be added to the vessel. This is a significant factor in terms of both vessel performance and fuel consumption and therefore lightweight solutions would be highly preferable.
- **Flexibility:** CTV design and construction allows for significant dynamic movement within the frame and body of the vessel at sea. Proposed solutions must therefore account for, and be compatible with, this dynamic movement and flexibility of the vessel.
- **Adaptability:** There are many different shapes, sizes and internal fixtures and fittings across the UK's CTV fleet. As such, any solution must have a degree of adaptability to ensure that it is fit for purpose across as many vessels as possible.
- A typical envelope for the internal dimensions of a CTV crew saloon are approximately between 4-8m in width and 4-14m in length, with an internal floor to ceiling height of between 2-3m.
- **Ease of installation – ideally suitable for self-installation:** The UK's fleet of around 200 offshore wind CTVs operate from a large number of ports around the UK, often in relatively remote locations. As such, any solution should ideally be designed such that self-installation is a viable option for CTV operators.
- **Comfort and movement within the vessel:** Proposed solutions should allow for free and continued movement from segregated areas within the Saloon to the areas of the vessel that technicians will need to access in order to perform their normal tasks of work. This should include the deck area of the vessel for transfer to turbines as well as for boarding and leaving the vessel. Technicians will often be dressed in PPE including immersion suits, helmets and harnesses, thus slightly restricting flexibility and agility of movement. Proposed solutions should account for this in their design.
- **Cost:** The CTV industry is highly competitive and price sensitive. As such, any solution must account for the price sensitivity and not introduce excessive additional operating costs.
- **Best Practice:** The G+ Small Service Vessel Good Practice Guideline presents best practice for on offshore wind farm workboats and should be complied with. It can be accessed at this link.
- **Evacuation:** A solution should be able to allow the timely emergency evacuation of the area it would be employed in and should not hinder the execution of any other emergency function.

Operating Conditions

The solution will be fitted to or used on working boats and may not be limited to the UK or the wind industry, other workboat users may adapt the solution to bring confidence back to their workforce and fully utilise their assets safely.

Deployment Timescale

- Launch of the Competition: Thursday 7th May
- Deadline for applications: Friday 12th June
- Selection and notification of finalists: 19th june
- Solutions should be:
  - Fully deployable for prototype testing within 1-2 months of competition win.
  - Full commercial deployment within 3 months (there are operational sites that a solution could start work on immediately if the system is already commercially available).

Cost requirement and market opportunity

Cost will be a key criterion for selecting an applicant and as such should reflect the practicalities of a highly cost sensitive industry like offshore wind. If costings cannot be provided at the stage of application submission, estimates would be appreciated.

Workboats active in the offshore wind industry are the primary target market and there are approximately 200 of these in service across the UK. The companies involved in the UK wind market are world-wide businesses and may select to have designs fitted across their international fleets.

Other craft such as pilot boats, in and around UK waters may also have similar demands escalating the wider target audience to approximately 4-600 vessels.

The market beyond offshore wind potentially covers other passenger transport vessels in other sectors and the KTN team can support applicants to access these markets if applicable.

Eligibility and assessment criteria

Entrants to this competition must be:

- *Established businesses, startups, SMEs or individual entrepreneurs*
- *UK based or have the intention to set up a UK base*

Applications will be assessed on:

- *Relevance to the topic*
- *Innovative nature of the subject*
- *Coherence of the proposed business model*
- *Feasibility/ economic viability*
- *Development potential*
- *Maturity of project/solution*
- *Ability to launch project quickly/Ease of implementation*

- *Price/quality/safety ratio*
- Suitability for the UK and European Market

IP and Potential Commercial Route

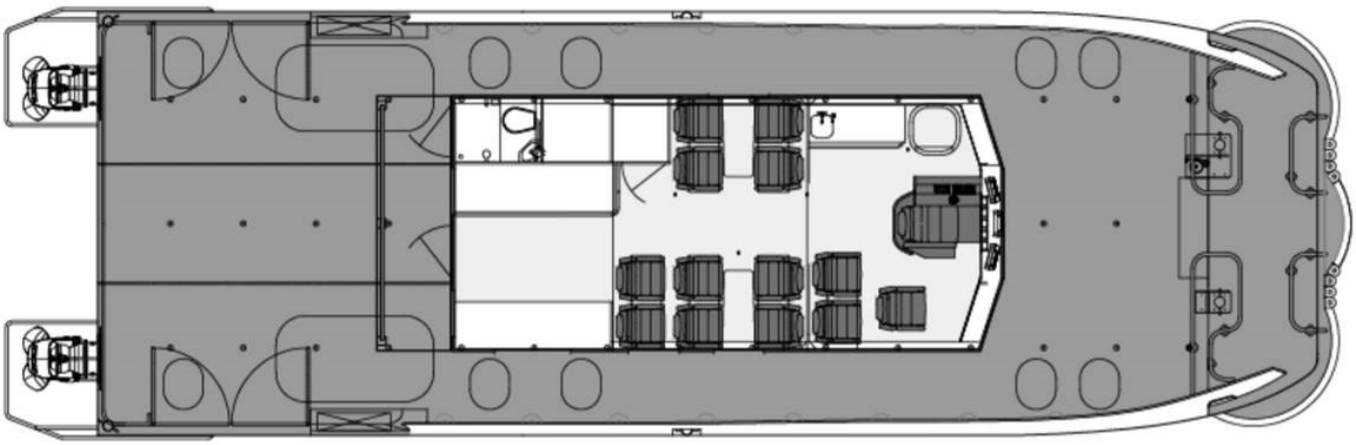
Existing background IP associated with a potential solution will remain with Solution Provider(s). Where any new IP generation is envisaged, it will be subject to the mutual IP agreement of the Solution Provider(s) and Innovation Challenger.

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 Challenger.

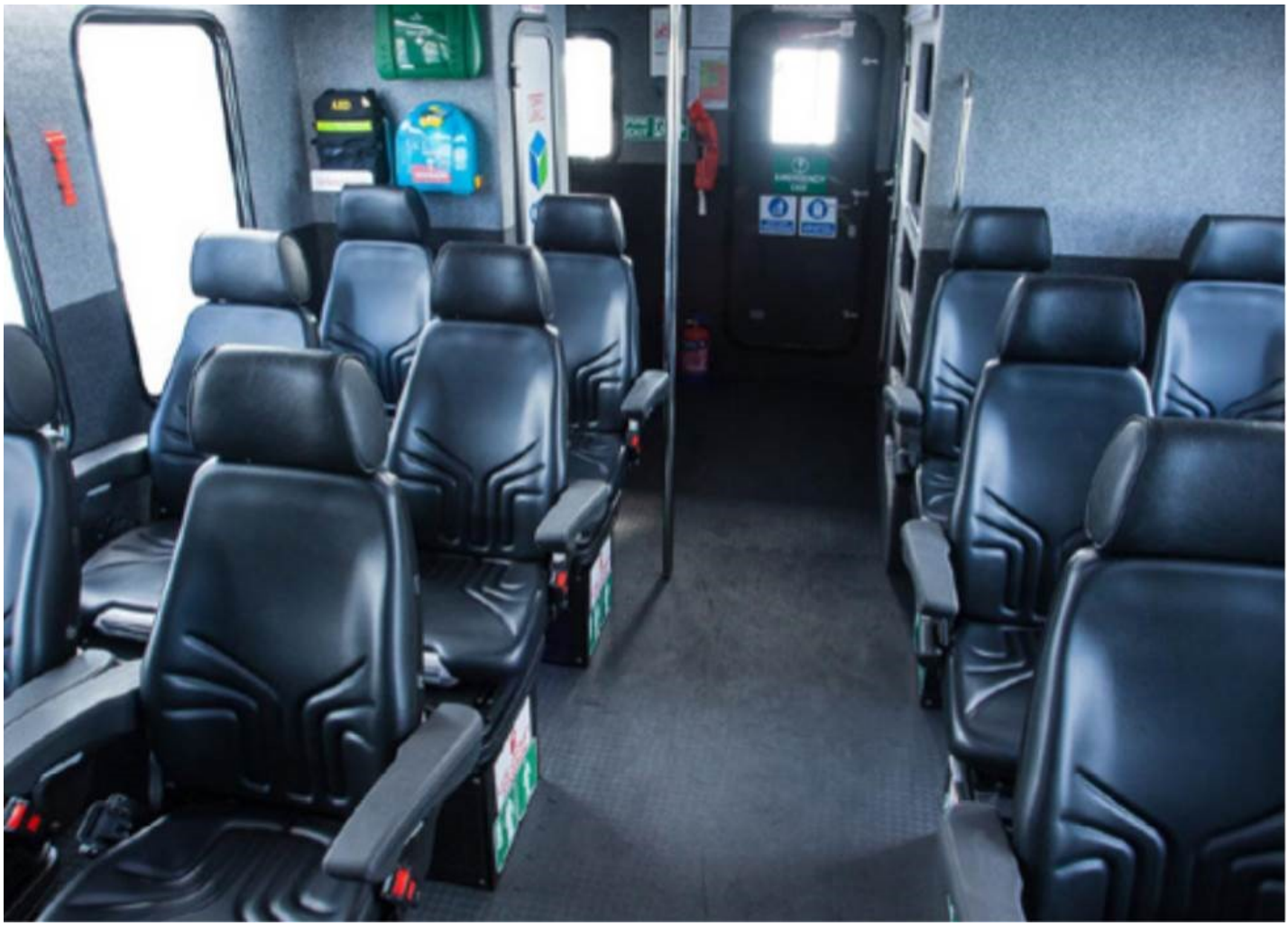
Where necessary, a non-disclosure agreement (NDA) may be signed to uphold confidentiality in the engagement between the Solution Provider(s) and Innovation Challenger.

Innovate UK and KTN do not take any share of IP ownership or enter into commercial venture through the OWiX programme.

Further images of workboats for reference



Plan view and schematic of a typical small sized CTV



The inside of a typical CTV saloon

A CTV in transit