

1.1. Emergency Contact Information

Name	Organisation	Phone number	Email	Address
Mike Galbraith	C-Gen Engineering Ltd - Project Manager	07971 805798	m.galbraith@c-gen.co.uk	2.27 Murchison House The Kings Buildings Edinburgh EH9 3BF Scotland UK
Nick Pollard	Rudders Boatyard – Vessel Contractor	07940 008 145	info@ruddersboatyard.co.uk	Rudders Boatyard, Church Rd, Milford Haven SA73 1NU Wales UK
Saul Young ERCoP Contact	META Operations Manager	07944 839 332	Saul.young@marineenergywales.co.uk	Pembrokeshire Coastal Forum, 2 nd Floor Pier House, Pembroke Dock, Pembrokeshire SA72 6TR Wales UK

1.2. OREI Information

1.2.1. Device Description

META would like to deploy the device described below at the **META Warrior Way site from 1st June 2025 to the 31st August 2025.**

The device comprises of an electrical generator designed by C-GEN Engineering, that is integrated with a micro horizontal axis tidal turbine (3m diameter) designed by Swansea University and mounted on a test barge (Figure 1) provided by Rudders Boatyard. This turbine mounted on this barge was extensively tested at Warrior Way in 2023 and 2024. The novel addition to this proposed deployment is the C-GEN electrical generator. This 800mm diameter generator is fully sealed and will be mounted directly on the end of the turbine shaft. A cable dragchain will carry the power and sensor cables from the generator to the power conversion panel on board the barge. Power will be stored in the 48Vdc battery loadbank and any excess will be dumped to a resistive load. The blade will be fully submerged at all times with a minimum clearance of 2m from the sea surface. The tidal energy convertor’s rated capacity is 3kW. **There is no export cable and power generated will be consumed onboard the device.**

The floating platform (10m x 6m) will be moored in position with a swinging mooring using two 2.5tn sinkers 10m apart perpendicular to the flow, each with ground chain and octoplat rope risers, attached to a large swivel and hard-shell buoy, to which the floating platform is then tethered to using a bridle. This mooring arrangement will allow the platform to align with the flow on both the flood and ebb tide. Deployment and Decommissioning of the device and anchors will be performed by one vessel with appropriately sized lifting capability. Anchors and mooring lines will be deployed first, then the device will then be towed to site and connected to the pre-laid moorings. Decommissioning can then be performed in the reverse order.

The drawings and pictures below illustrate the system (Figure 1 - 4).

1. Gravity anchor
2. Chain
3. Mooring Line
4. Swivel connector – swinging mooring
5. Test barge with turbine attached
6. Tidal turbine and generator (enclosed yellow box)

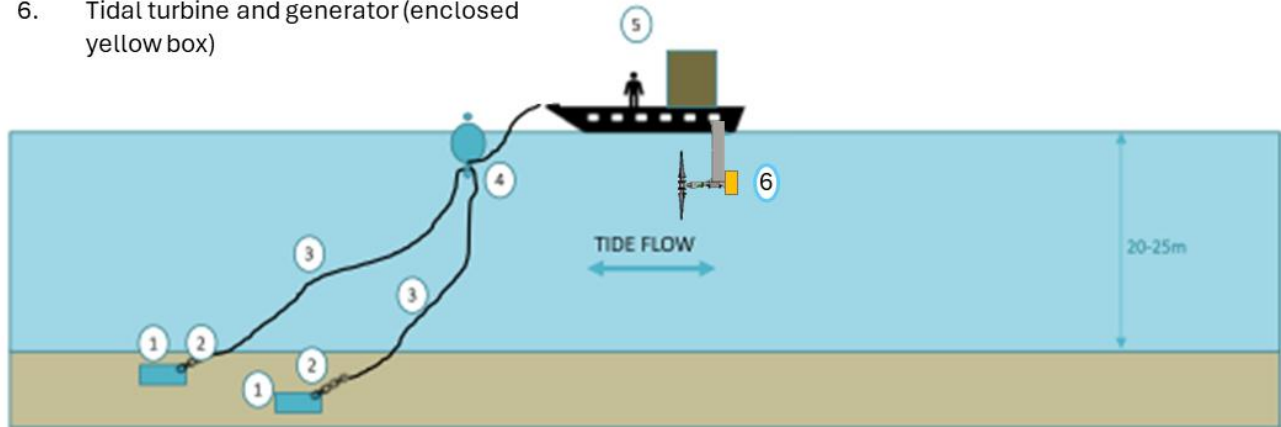


Figure 1 Illustration of full system. Not to scale.



Figure 2 Rudders Boatyard test barge (10m x 6m)

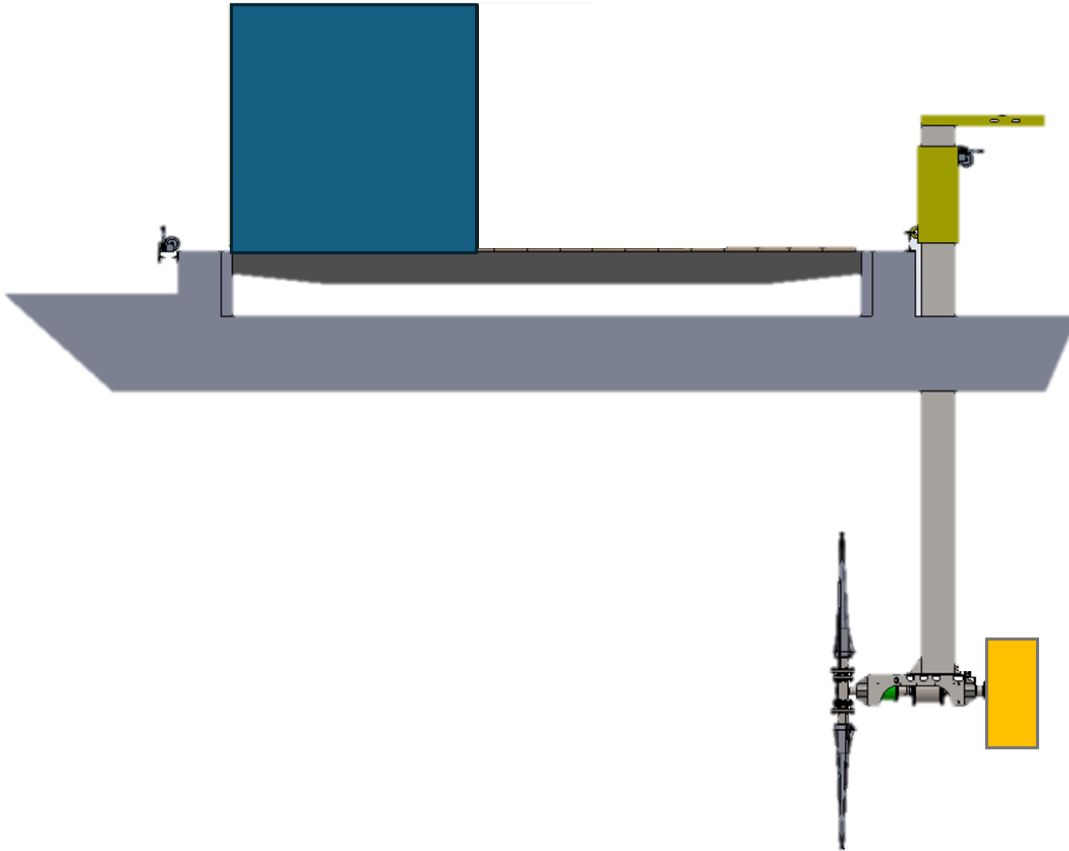


Figure 3 Device in operational position.

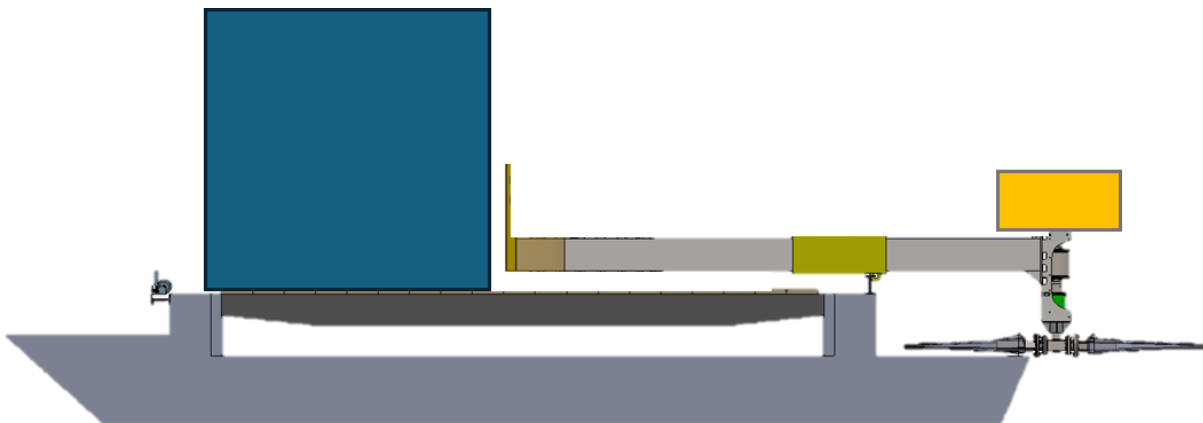


Figure 4 Device in towing position.

1.2.2. Key Locations

The device and moorings are to be located at the following co-ordinates in decimal degrees:

	Latitude:	Longitude:	Approx Depth (LAT):
Swinging mooring position	51° 42.222' N	4° 55.61' W	16m

Table 1 - Device and mooring deployment co-ordinates

The device will be deployed on a swinging mooring therefore the device will move upstream and downstream of the mooring depending on whether the tide is coming in or out. This mooring design has been chosen so the device always aligns with the current direction and so it can operate in both an incoming and outgoing tide.

For the proposed swinging mooring arrangement, the maximum swing radius from the central mooring position (51.703731N 4.926829W) to the end of the device will be ~43m (Figure 4). **For clarity this distance of 43m relates to the radius i.e. the distance from the central mooring point to the circumference.** This is the worst-case scenario for a LWS (Low Water Spring) when there is the most slack in the mooring lines. The device will only be swinging during slack water as the tide turns. Once the tide turns the device will find a settled position either upstream or downstream of the mooring depending which way the tide is flowing. The two mooring blocks will be positioned around 10m apart perpendicular to the tide to minimise lateral movement in relation to the tidal flow direction so the swing radius across the channel will actually be less than the worst-case scenario.

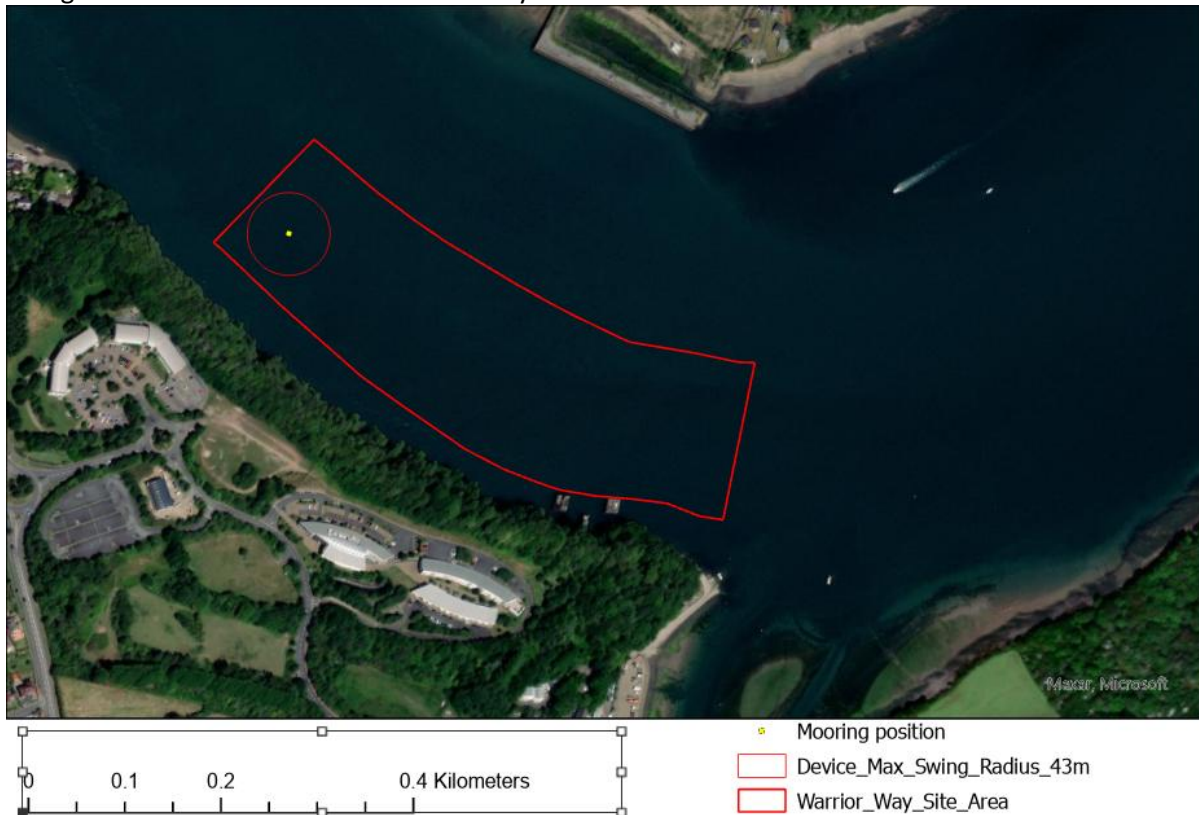


Figure 5 Device position and worst-case scenario (Low Water Springs) swing radius of the swinging mooring. **For clarity the distance of 43m relates to the radius i.e. the distance from the central mooring point (yellow dot) to the circumference (red circle).**

Rudders Boatyard will be the vessel contractor. The chart below shows the tow route that will be taken from where the device is launched at Rudders Boatyard and the mooring location (Figure 5)

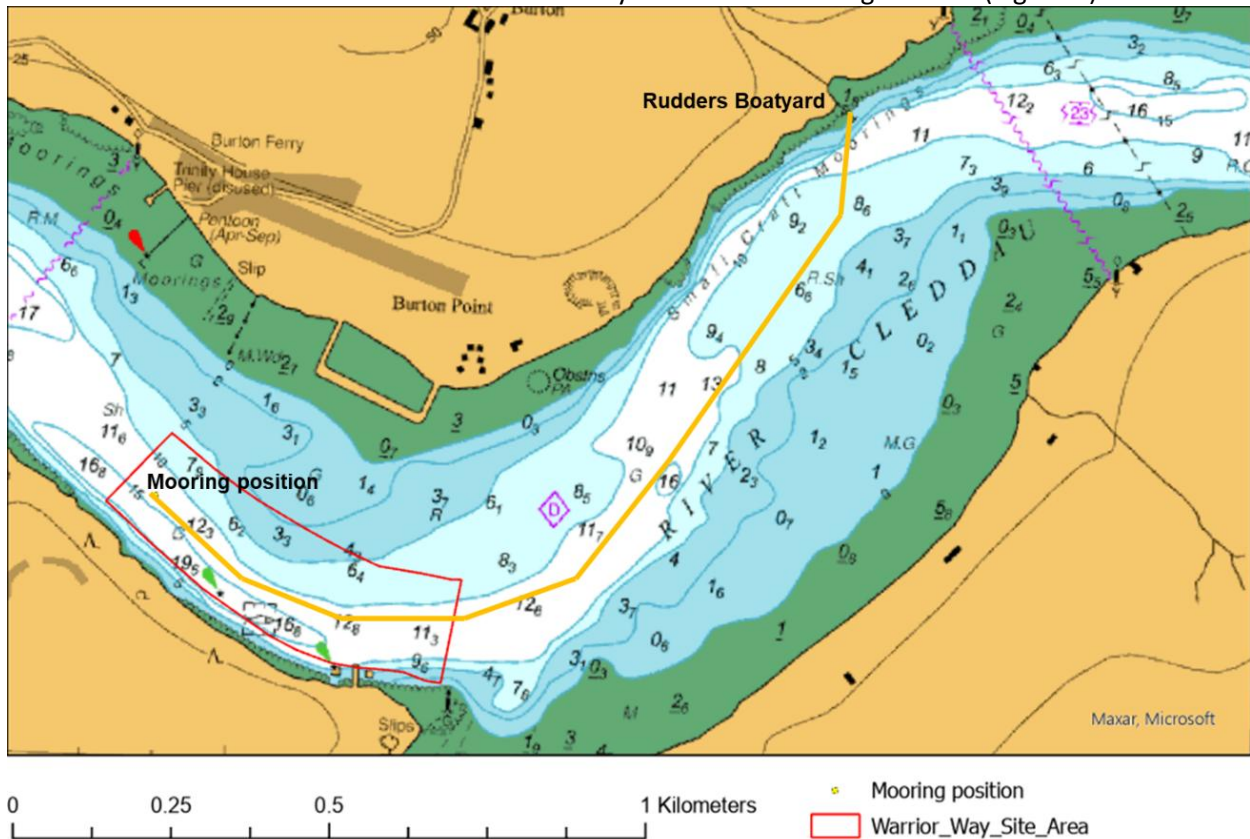


Figure 6 Tow route between the mooring location and the vessel contractor Rudders Boatyard.

1.2.3. Device Technical Information:

Parameter	Description/Value
No. of OREIs	1
Device Dimensions (Floating Platform), LxWxH	10 x 6m x 5m
Device Height above sea level	3.3m
Turbine Rotor Diameter	3m
Turbine blade maximum depth below sea level	5m
Temporary safety zone around device	N/a
Mooring type	Gravity anchor (clump weight)
Mooring weight	2.5 tonnes
No. of moorings	2
Device markings and signage	- Yellow cross day mark fitted at height above top platform -

Parameter	Description/Value
	<ul style="list-style-type: none"> - Device to be lit as per appropriate COLREG Rule 30 (Lights for vessel at anchor). - All Mooring equipment to be clearly marked with yellow marker buoys marked: WARNING MARINE ENERGY DEVICE NO MOORING - Signage on device access points: WARNING MARINE ENERGY DEVICE NO MOORING NO CLIMBING OR BOARDING
Device monitoring/tracking	<ul style="list-style-type: none"> - GPS Tracker - Device is visible from shore, and will be checked regularly throughout the deployment - Remote monitoring of onboard computers
Operational Safety measures	<ul style="list-style-type: none"> - Third Party Verification (TPV) of the mooring system prior to deployment - All electrical equipment is in a lockable offshore cabin <ul style="list-style-type: none"> - Safe system of work in place - During any (limited) unmanned testing, remote control will be managed through internet connection with onboard computers via mobile phone signal.
Real time weather info available	N/a – Mobile data signal available on site

1.2.4. Device Recovery method in event of mooring failure: The device location will be tracked using the onboard GPS tracker. An automated notification will be sent to Rudders Boatyard staff when the GPS moves outside of the designated area. In this event they will retrieve the device and tow it safely back to the boatyard for further investigation/repair.

1.3. Emergency Response

1.3.1. Equipment stored on Floating Tidal Energy Device:

- First Aid Kit

1.3.2. PPE while working on Floating Tidal Energy Converter:

- Lifejackets
- Immersion suits/or offshore coveralls
- Safety Boots

1.3.3. Emergency Communications

- Vessel/s to be fitted with VHF radios
- Handheld VHF radios will be carried by the crew on the barge. If required there is power available on board the barge to recharge batteries.
- procedures agreed between the *MRCC* and operator, for calling for assistance.

- o Vessels engaged in activities at META sites, or in transit to these sites, will monitor VHF channels 12 (Milford Haven Port Control) and 16 (initial calling and emergency) at all times.
- o The primary form of emergency communication will be via Marine VHF on channel 16, either through verbal communication or by DSC alert.
- o In case of an emergency that requires MCA support, the MRCC (Marine Rescue Coordination Centre) will coordinate the response and will advise on the appropriate form and channel for continued communication after the initial contact.
- o Depending on the nature and severity of an incident, mobile phones will be used to facilitate further communications to shore, where this appears to be appropriate.
- o Ship to Ship communications on site will be normally on VHF channel 6 or 8, or as otherwise agreed. Deck to bridge communication onboard the vessels will be via the agreed working channels using handheld VHF radios as carried by the crew.

1.4. Emergency Shutdown Procedures and Processes

Remote Shutdown Procedure – should the control detect the requirement to shutdown the system, then the brake load resistor contact will engage. The brake load will be sized to bring the turbine to a standstill. The contactor switches between normal generation and brake load, the energised position is normal running making the system failsafe during a power failure.

Manual Shutdown Procedure – the control panel is fitted with an emergency stop pushbutton which again releases the brake contactor. The system will be required to reset before restarting and this can only be done manually on the barge. During shutdown the turbine blades remain held by the brake resistor.

Whether the device is manned or unmanned any loss of power will also shutdown the system and bring the blades to a halt.

1.5. Deployment/recovery Activities

NOTE: information during any deployment or recovery phase is dynamic and should be sent in periodic (e.g. daily, weekly) emails and/or verbal update reports to HM Coastguard. Notices issued should be copied to oeo@mcga.gov.uk and renewables@hmcg.gov.uk .

1.5.1. Table indicating the day-to-day operations taking place on the site during the entire deployment:

Installation		Target Date
Task	Description	
1.1	Assembly of barge and tidal energy convertor hardware at Rudders Boatyard.	May 2025
1.2	Vessel contractor to make up and install mooring.	1 st June 2025
1.3	Vessel contractor to tow the assembled device to the test site and connect it up to the pre-installed moorings	5 th June 2025
Operations and Maintenance		
Task	Description	
2.1	In-situ and remote performance testing.	5 th June – 31 st August 2025
2.2	During the test programme the vessel contractor may detach the device from the moorings and tow it back to the contractor's dock to conduct maintenance and optimisation tasks that cannot be conducted at sea. Following the completion of the necessary works at the dock the vessel contractor will tow the device back to site and reconnect it to its moorings.	5 th June – 31 st August 2025
Decommissioning		
Task	Description	
3.1	Once testing is complete, the vessel contractor is to detach the device from the moorings and tow it back to the contractor's dock.	1 st September 2025
3.2	All hardware and equipment are to be removed from the barge. Heavy objects, i.e. turbine and container/cabin, are to be crane lifted from the barge.	1 st – 5 th September 2025
3.3	The barge is then to be disassembled and crane lifted from the water by the vessel contractor.	1 st – 5 th September 2025
3.4	The vessel contractor is to lift and remove the moorings from the test site, leaving no equipment on the seabed.	1 st – 5 th September 2025

1.6. Vessels/Installations on Site during Deployment or Work and Safety Boats during Operations.

Please see the table above for a summary of the main activities involved in the deployment/installation operation of the tidal energy device. A maximum of 2 vessels will be required at any one time including a coded workboat and coded RHIB. The workboat will have a tender/safety boat onboard for emergencies and the vessel contractor will be able to mobilise further vessels from nearby base to respond to an emergency.


For the deployment, O&M and decommissioning of the tidal energy device, the vessel contractor shall provide a coded workboat with lifting capability. The vessel will be kept at the vessel contractor's dock, which will be in the Pembroke Dock area/Milford Haven estuary.

A coded RHIB operated by Rudders Boatyard will be used as a support and crew transfer vessel.

Details of the vessels to be used for deployment, O&M and decommissioning is provided in the table below:


Vessel 1:


Item	Description/Value
<i>Vessel Name</i>	RB1
<i>Vessel callsign and Maritime Mobile Service Identity (MMSI) number</i>	Vessel Name RB1 Call Sign MHLJ2 MMSI 235024988
<i>Type of vessel</i>	11M Workboat
<i>Speed and endurance</i>	<u>24H <12Knts</u>
<i>Personnel capacity</i>	4
<i>Normal number of crew carried</i>	2
<i>Weather and/or other operational limitations including turbine transfer limits</i>	Operating limit F5, Turbine Transfer Limit F3
<i>Medical and/or other ER capabilities including relevant equipment and/or medication</i>	Cat C first aid kits onboard, along with qualified first aider
<i>Telephone contact numbers (mobile and/or satellite)</i>	07940 008 145 Office Number - 01646 600 288
<i>Communications equipment fitted e.g. VHF, MF and HF Marine band radios, satellite systems, fitted, etc.</i>	GPS & VHF
<i>Communications channels/frequencies monitored during normal and abnormal operations e.g. when at sea proceeding to and working in the wind farm</i>	16 & 12

Item	Description/Value
<p><i>Pictures and (if available) drawings of the craft.</i></p>	

Vessel 2:

Item	Description/Value
<i>Vessel Name</i>	KITCAT
<i>Vessel callsign and Maritime Mobile Service Identity (MMSI) number</i>	Call Sign: MGZE8 MMSI: 235074502
<i>Type of vessel</i>	Multicat Length – 20.2m Beam – 6.54m Draft (loaded) – 1.3m
<i>Speed and endurance</i>	6knt cruising speed 3,200L Fuel Capacity
<i>Personnel capacity</i>	5 + 3 crew
<i>Normal number of crew carried</i>	3
<i>Weather and/or other operational limitations including turbine transfer limits</i>	20nm Offshore
<i>Medical and/or other ER capabilities including relevant equipment and/or medication</i>	Cat C First Aid + all additional equipment required for Cat. 3 Coding

Item	Description/Value
<i>Telephone contact numbers (mobile and/or satellite)</i>	Skipper: 07969552006
<i>Communications equipment fitted e.g. VHF, MF and HF Marine band radios, satellite systems, fitted, etc.</i>	2 x Fixed VHF, 2 x Handheld VHF Koden Class A AIS
<i>Communications channels/frequencies monitored during normal and abnormal operations e.g. when at sea proceeding to and working in the wind farm</i>	16 & 12
<i>Pictures and (if available) drawings of the craft.</i>	 A photograph of a red and black barge or tugboat on a river. The vessel is equipped with a yellow excavator and various equipment, including a white cabin and a mast. The river is wide and calm, with a bridge visible in the background under an overcast sky.

Item	Description/Value
	

NOTE: The immediate rescue and emergency response capability for developer personnel or other contractors working on or in the OREI are the work and safety boats provided by the developer/site owner.

1.6.1. Guard Vessel

N/A – no guard vessel required for this site/deployment.

1.6.2. Rescue Boat Capabilities

If the workboat is **on site** initial SAR capabilities will be provided by this vessel.

If required, the vessel contractor will mobilize a rescue boat via radio.

In the event an emergency the Developer or their contractor will firstly, immediately notify the coastguard and secondly, immediately notify Milford Haven Port Authority (MHPA) Port Control.

*Coastguard Contact:
VHF Channel: 16
Tel: 0344 382 0748 / 999*

*MHPA Port Control:
- VHF Channel: 12
- Tel: 01646 696137*

If the vessel operator has no vessels available or if the emergency occurs outside of the vessel operators usual working hours assistance from MHPA or the Coastguard may be required.

1.7. Locating Aids Used by Personnel or Vessels Working at the Site

N/A:- personnel or vessel locating devices will not be required as the test area is situated in the Milford Haven estuary where there is clear visibility from shore and work will take place during daylight hours.

1.8. Electronic Surveillance and Monitoring Systems

The device location will be tracked using the onboard GPS tracker. An automated notification will be sent to Rudders Boatyard staff when the GPS moves outside of the designated area. In this event they will retrieve the device and tow it safely back to the boatyard for further investigation/repair.

A member of the Rudder Boatyard team will carry a phone/device linked to the GPS tracker at all times, and the alert will be sufficient volume to wake the duty person if outside waking hours and the alert will be set to repeat until it is read.

1. Emergency Action Card

EMERGENCY ACTION CARD

For C-GEN

Device specific information can be found in section [1.2](#). Secondary contact should also be made with the Site Owner using the main ERCoP (*HMCG to insert link to SharePoint folder*)

Emergency Contact	
One of the following or a combination of both, must be 24/7	
Duty Holder name	C-GEN
Primary Emergency Number	07971 805798 (Mike Galbraith – C-GEN)
Secondary number	07944 839 332 (Saul Yong – META Ops)
Media relations	07748 740 347 (Jetske Germing – PCF MD)
Coastguard	0344 382 0748
Police	01267 222020 (Milford Haven)

Location Summary	
Phase	Construction/ Operation
Range & Bearing from land	51° 42.222' N 4° 55.61' W
Number of devices	1

Device Specific information <i>(include an additional table if more than 1 device type)</i>					
Heights (above LAT, in m & ft)		Lights <i>Incl. flash, IR, colour, etc.</i>		Helicopter Winch	
Total height to blade tip	<i>n/a</i>	Aviation lights	<i>n/a</i>	Suitable for winching?	Yes
Height of Nacelle	<i>n/a</i>	SAR lights	<i>n/a</i>		
Height of Transition Piece	<i>n/a</i>	Other lights	One all-round white light (COLREG Rule 30)		
Height above sea level	<i>3m</i>				
Depth below surface	<i>5m</i>				
Height above seabed	<i>11m LAT</i>				

Communications		
VHF	Aviation	Additional comms
<i>channel 16, VHF handheld radio</i>	<i>n/a</i>	<i>n/a</i>

Electronic Monitoring <i>(include details if feeds are provided to HM Coastguard)</i>		
AIS	Radar	CCTV
<i>n/a</i>	<i>n/a</i>	Yes

Site Rescue Teams

Site rescue will be performed by the vessel onsite at the time: No personnel are to be left onboard the device without a vessel present. And work onboard the device is only performed during daylight hours. Therefore, rescue will be performed by the vessel present at the time.

If an additional vessel/rescue team is required, this will be mobilised from Rudders Boatyard, who are based 10 minutes from the device location.

Shutdown procedure

Manual: Emergency Stop Pushbutton releases Brake Load Contactor. This isolates the generator and brings the turbine to a controlled stop. The contactor is failsafe if power is lost.

Remote: The Brake Load Contactor can be released remotely but resetting the system requires attendance on the barge.

Whether the device is manned or unmanned any loss of power will also shutdown the system and bring the blades to a halt.

During shutdown the turbine blades remain held by the brake resistor.

Any contact information contained in the EAC and provided to the Maritime and Coastguard Agency (MCA) will be used solely for the purposes of emergency response as part of the Agency's functions and by the MCAs SAR helicopter provider. The information will be kept secure and will not be used for any other purpose without their permission. The information will be stored by the MCA and the SAR helicopter provider until the company provides updated information or the development ceases to exist, at which point the information will be deleted.