PARTRAC

Vattenfall

Aberdeen Offshore Wind Farm: Real-Time Waves and Currents

Method Statement
Health, Safety & Environmental Risk Assessment

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1. METHOD STATEMENT

1.1 Outline of works

Aberdeen Offshore Wind Farm Ltd. (AOWFL) require specialist oceanographic observational services to support the construction and operation of Aberdeen Offshore Wind Farm (AOWF).

The Offshore consent for the AOWF is based on eleven (11) three-bladed horizontal-axis offshore WTGs each with a maximum blade tip height of 198.5 m above LAT, associated foundations, Inter-Array cables and Export cables.

AOWFL owns a Datawell Mk4 Waverider Buoy (herein referred to as *the Wavebuoy*) capable of measuring wave and current parameters and equipped with an Iridium SBD communications module. Data from the Wavebuoy is managed via PortLog, licenced by Oceanwise.

AOWFL has contracted Partrac Ltd to deploy, service and maintain the wavebuoy for a two year period from 1st November 2017.

The following Metocean data will be provided to a secure website in near real-time via a satellite up-link.

Total Sea:

- Significant Wave Height, Hs (m).
- Peak Period, Tp (s).
- Average Zero Up Crossing Period, Tz (s).
- Mean Wave Direction, θ_m (Deg).

Current

- Current Speed (ms^{-1}).
- Current Direction (Deg).

Ancillary

- Sea Temperature (degrees Celsius).
- Battery status
- GPS position

Data will be updated at an interval of 30mins.

The AOWF site is located approximately 2.5 km off the coastline of Aberdeeenshire at Blackdog, north-east Scotland. The water depth across the WTG locations is between 19m and 32m below LAT, and the export cable routes range between 0 and 24 m below LAT. Figure 1 and Table 1 provide the proposed wavebuoy deployment position.

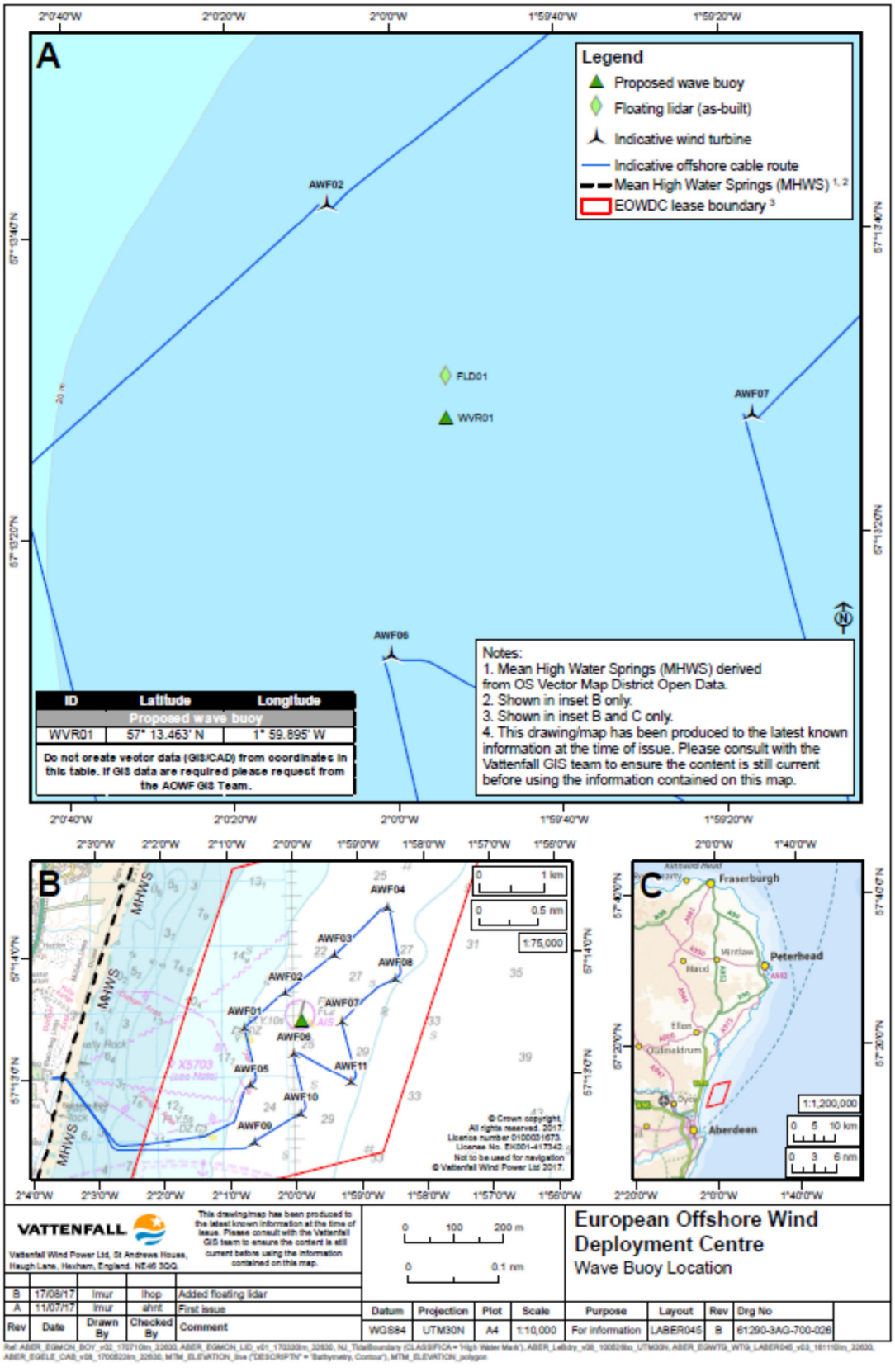

Figure 1 Aberdeen Offshore Wind Farm Wavebuoy Location (Courtesy of Vattenfall)

Table 1 Proposed wavebuoy deployment position

Location	Latitude	Longitude	Water depth (m MSL)
WVR01	57° 13.463'N	001° 59.895'W	25.0

This method statement covers the deployment servicing and recovery of the Datawell Mk4 Waverider buoy.

1.2 Equipment & Tasks

Number	Principal Equipment Required	Certification?	Who inspects?
1.	Rover Alpha (Ness Offshore)	Y	IMCA auditor
2.	Vessel lifting equipment	Y	IMCA auditor
3.	1 x Datawell Mk4 Waverider and associated mooring components	N	S Reynolds
Number	**Participants**	**Position**	**Done before?**
1.	Saul Reynolds	Party Chief	Y
2.	Ross Flatman	Marine Survey	Y
3.	Vessel deck crew and crane operator	Deck	Y
Number	**Procedures**	**Who performs?**	**Who supervises?**
1.	Inspection and test of vessel equipment	Vessel	S Reynolds
2.	Deployment management	R Flatman	S Reynolds
3.	Feeding out bungee / mooring line	R Flatman	S Reynolds
4.	Release of ground weight	R Flatman	S Reynolds
5.	Verification of deployment co-ordinates and water depth	S Reynolds / Vessel Captain	Partrac
Number	**Environmental Precautions**	**Responsible person**	**Supervisor**
1.	Suitability of environmental conditions	S Reynolds / Vessel Captain	S Reynolds / Vessel Captain
2.	Oil spill prevention (use of prevention kit)	Vessel Captain	R Flatman/ Vessel Captain
3.	Fuel spillage prevention (use of spill prevention kit)	Vessel Captain	R Flatman / Vessel Captain
4.	Recovery of all equipment from the seabed	R Flatman	S Reynolds

1.3 Methodology

1.3.1 Vessels

The vessel to be used for deployment and recovery operations is the Rover Alpha (Figure 2) supplied by Ness Offshore, and it is based in Fraserburgh. The specification of the vessel is given in Table 2, and it will be loaded and mobilised in Aberdeen Harbour.

Figure 2 Ness Offshore vessel Rover Alpha

Table 2 Rover Alpha vessel details

Item	Detail
Type of Vessel	Workboat
Functions	Survey, workboat, ROV
LOA	18.2m
Beam	6.0m
Draft Aft / Forward	3.4m / 2.8m
Speed (cruising)	8 knots
Winches	Handling winch (SWL 5T), Anchor winch (2T)
Crane	HMF type M111 410 deg rotation Crane SWL 3500kg @ 5.5.m, 1250kg @ 8.5m
Thruster Forward and Aft	Brunvoll Electro Hydraulic 60kw
Accommodation	Three berths, WC shower, galley and lounge/mess room.

1.3.2 Instrument and Mooring Configurations

Mooring components are configured for the water depth of 25m plus tidal range.

Below is the specification for the individual system components. All shackles and rope will be supplied with LOLER certification (where applicable). All components will be examined by a competent person.

- 1 x Datawell Mk4 Waverider Buoy.
- 1 x 4-part Stainless Steel (SS) shackle + SS split pin.
- 1 x 30 m rubber bungee.
- 1 x 1T large SS shackle.
- 1 x 60 m x 18 mm Polysteel rope (SS thimble eye one end, galvanised eye spliced in the other end).
- 1 x 3.25T 4-part Green Pin Bow shackle.
- 1 x 11" trawl buoy on rope spliced into polysteel rope at 5m above ballast weight.
- 1 x 2.5 m HLZ-9 chain to ground weight.
- 1 x 2T 4-part Green pin Bow shackle for attaching chain tail to ballast weight.
- 1 x 500 Kg chain ballast weight.

The integrity of all connection points is to be verified when the mooring is laid out on deck.

A schematic of the mooring configuration is depicted in Figure 3.

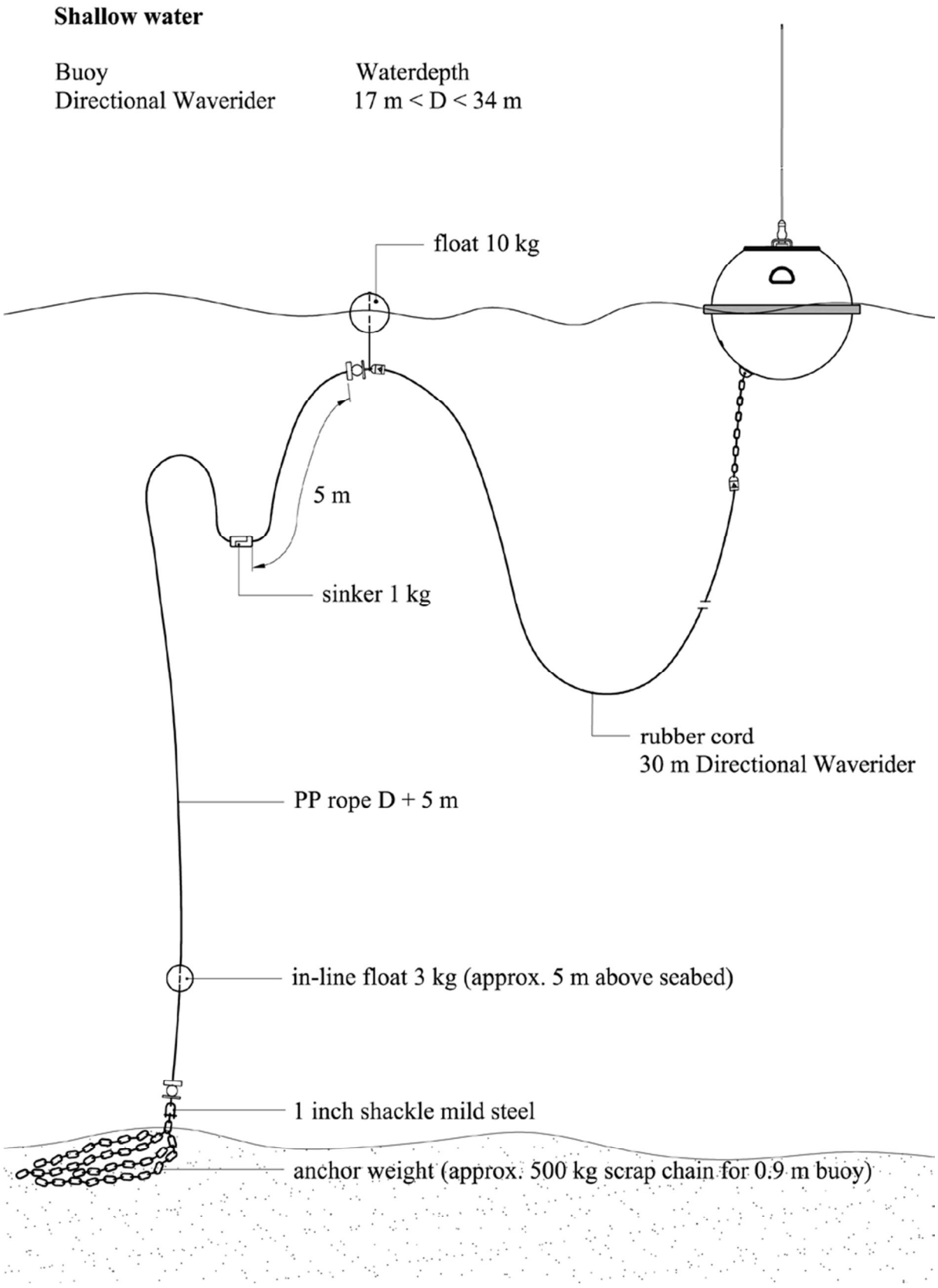

Figure 3 Mooring layout for the Datawell Mk4 Waverider Buoy, configured for 25 m water depth.

1.3.3 Assessment of Weather & Mobilisation

Persons responsible: Party Chief (Saul Reynolds), Vessel Captain.

Assessment of the weather conditions for instrument deployment and recovery will be completed through a combination of the Meteogroup site specific forecast, Meteorological Office forecast, various other wind and swell predictions, verification with near real time observations and local knowledge. If a suitable weather window is available then mobilisation can commence.

The equipment deployment and recovery operation limits set by Partrac for the wavebuoy are:

- Hmax = 1.50 m.
- Hm0 = 1.00 m.
- Wind speed = 15 knots.
- Daylight operating hours only.

The maximum current speed during deployment is 0.8 knots.

1.3.4 Deployment

Logistics

- Final review of the metocean conditions and forecast for the day's operations.
- Vessel skipper to inform AOWF Marine Control and VTS of the vessel departure, working location and expected time of return to port.
- When approaching site, make contact with any working vessels to inform them of our operations.
- Arrive at the deployment site and assess weather conditions and wave height. If conditions are considered safe then deployment operations can commence.

Pre-deployment:

- Tool Box Talk is to be completed on site by the Party Chief.
- Final verification of co-ordinates and water depth.
- After assessment of current and wind conditions a decision will be made as to whether to:
    - Maintain position facing into current and let current take the buoy and mooring line away from the vessel; or
    - To manoeuvre towards position and let the mooring and buoy pay out behind the vessel; or
    - A combination of the two options above.
- Sea fastenings removed from all equipment at point of lift.

Responsibilities:

- Crane and winch operations: Rover Alpha.
- Deck work: Ross Flatman/ Rover Alpha
- Watch Officer: Rover Alpha.
- Coordination of back deck movements: Saul Reynolds.
- Positioning: Saul Reynolds/ Rover Alpha.

Deployment:

- The ballast weight will be manoeuvred over the stern quarter of the vessel on the starboard side to sea level, using the crane. The weight will be taken on a 1 tonne sling and quick release *Seacatch* release mechanism. A stopping sling with safety hook will be attached to the weight and connected to a bollard on deck for security and the crane will be detached from the weight.
- The crane will be connected to the lifting bridle on the wave buoy and the buoy lifted overboard and lowered to the sea surface. The buoy will then be released from the crane using a second *Seacatch* quick release mechanism.
- The buoy will drift away as the vessel moves slowly ahead towards the deployment location OR the vessel will hold station and let the mooring drift away from the vessel, depending on conditions at the site. The bungee and mooring rope will be slowly paid out, coming up tight on to the ballast weight. A boat hook is to be available to fend off the mooring rope if required.
- When within 100m of the position, the stopping chain will be removed from the ballast weight.
- On position, the weight will be released using the *Seacatch* release.
- The deployment position will be recorded on the DGPS.
- The buoy position will be briefly monitored to ensure the mooring has not been compromised during deployment.
- Buoy transmissions will be verified at the earliest opportunity via cell or satellite phone to the Partrac office.
- Vessel will return to Aberdeen Harbour.

1.3.5 Recovery

Logistics

- Final review of the metocean conditions and forecast for the day's operations.
- Vessel skipper to inform AOWF Marine Control and VTS of the vessel departure, working location and expected time of return to port.
- When approaching site, make contact with any working vessels to inform them of our operations.
- Arrive at the deployment site and assess weather conditions and wave height. If conditions are considered safe then deployment operations can commence.

Pre-recovery:

- Tool Box Talk is to be completed on site by the Party Chief.
- A securing line for the mooring will be attached to an appropriate fixed point on the deck of the vessel by the vessel crew.

Responsibilities:

- Crane and winch operations: Rover Alpha.
- Deck work: Ross Flatman / Rover Alpha.
- Watch Officer: Rover Alpha.
- Coordination of back deck movements: Saul Reynolds.
- Positioning: Saul Reynolds / Rover Alpha.

Recovery:

- The vessel will approach the wave buoy and a boat hook will be used to grab the bridle on the buoy.
- Once in a safe position, the vessel crane hook will be attached to the bridle on the buoy, along with tag lines for control during lifting.
- The buoy will then be lifted using the vessel crane and once on deck will be secured. The crane can then be disconnected from the buoy.
- The tag lines will be released. A trawl block will be connected to the crane hook and the crane will be positioned over the stern quarter (starboard side) of the vessel for recovery of the mooring and ballast weight.
- The bungee will be recovered by hand and the direction of the mooring will be continually relayed to the skipper to enable positioning of the vessel directly over the ballast weight on the seabed.
- When the entire bungee is on board and the mooring rope is accessible, the rope will be passed through the trawl block and secured with a stopping chain. The bungee will then be disconnected from the rope.
- The rope will be attached to the winch and the stopping chain removed. The remainder of the mooring rope will be recovered using the winch. When the ballast weight breaks the surface of the water it will be connected to the crane hook with a 1 tonne lifting strop and lifted aboard, using tag lines at all times.
- Once the ballast weight is on deck, the entire system will be fastened to the deck of the vessel.
-

1.3.6 Service Visits

Service visits will be planned to be executed every six months to carry out buoy maintenance and mooring verification/replacement.

Logistics

- Final review of the metocean conditions and forecast for the day's operations.
- Vessel skipper to inform AOWF Marine Control and VTS of the vessel departure, working location and expected time of return to port.
- When approaching site, make contact with any working vessels to inform them of our operations.

Service visit

The Waverider buoy service visit will include:

- Recovery of the wavebuoy and all mooring components using the methodology described in section 1.3.5 above.
- Servicing operations will be carried out on the aft deck of Rover Alpha whilst on site.
- All mooring components will be replaced with new certified constituents.
- The structural integrity of the wavebuoy and all lifting and connection points will be scrutinised. In the event that any damage is found, the buoy will be returned to shore for repair.
- The buoy will be opened and data will be downloaded on site. Internal checks will be carried out at this stage to look for signs of damage or water ingress. Battery voltages will also be manually verified.

- Any fouling on the buoy will be removed and the buoy will be cleaned.
- All O-rings and seal points will be inspected cleaned and replaced as necessary before the buoy is sealed up for deployment.
- Communications and data transmissions from the buoy will be verified on deck, if possible.
- The buoy will be re-deployed in the required location using the methodology described in section 1.3.4 above.

2. HEALTH, SAFETY & ENVIRONMENTAL RISK ASSESSMENT

Due to the dynamic nature of the operations, the on-site risks will be re-assessed and controlled.

All vessel and survey personnel involved in the works will be required to read and sign this documentation. This is to be issued in a timely manner in advance of works in order that amendments can be made if necessary and the output re-circulated to all relevant parties.

In addition to this Risk Assessment, personnel are required to take part in Tool Box Talks, Lift Plans and Vessel Inductions, each of which also require sign off by all personnel involved.

Health, Safety and Environmental incidents arising will be reported to the client at the earliest safe opportunity. Incidents requiring reporting to the HSE and/or the MCA will be completed as soon as is reasonably practicable.

A copy of the Risk Assessment will be available to all persons who could be affected, and will be stored on Partrac's server. A hard copy will be prepared for the project folder and will accompany the Survey Team offshore.

All documentation in support of the Risk Assessment including the Tool Box Talk form, Safety Observation Cards, Lift Plans and Vessel Induction forms will also accompany the team on mobilisation.

2.1 H&S Risks & Control Measures

The risks are assessed using the following scoring system.

Severity \ Probability	1	2	3	4	5
1					
2					
3					
4					
5					

Probability	
1	Almost impossible
2	Most unlikely
3	Possible
4	Most likely
5	Almost certain

Severity			
	Injury	Equipment damage	Environmental damage
1	No injury	No damage	No environmental impact
2	First Aid injury	Minor damage	Minor environmental impact
3	Medical treatment	Medium damage	Medium environmental impact
4	Lost time injury	Lost time damage	Major environmental impact
5	Fatality	Catastrophic damage	Environmental disaster

Legend		
	Low risk	No further action required
	Medium risk	Risk only acceptable after approval by project director
	High risk	Unacceptable as risk after mitigation, find alternative

2.2 Identification of the Top 3 Hazards

Activity	Identification of the Top 3 Hazards											
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable Tolerable Acceptable
				P	S	R		P	S	R	
1.	Lifting equipment.	Struck / crush.	Injury / fatality	3	5	15	Tested, certified and inspected lifting equipment only. Trained lifting operators only. Use of Banksman. Use of Tag lines. Tool Box Talk. Lift Plan. Use of appropriate PPE. Never stand underneath load or between a fixed structure and load.	2	5	10	Tolerable
2.	Vessel operations	Man over board	Injury / fatality	3	5	15	Guard rails to be kept in place at all times apart from when equipment is being deployed/recovered. If within 1m of open back deck harness must be worn. Replace guard rails at earliest opportunity. Use of 275KN life Jackets. No lone working. Day light working only. Mullion suits to be worn on back deck if water <10degs Celsius.	2	5	10	Tolerable
3.	Paying out mooring line during deployment.	Entanglement with persons.	Injury / fatality.	3	5	15	Tool box talk. Buddy system. Trained, competent personnel only. Ensure rope is in a 'reducing figure of eight' formation to allow free run. Never stand in the bight of the rope.	2	5	10	Tolerable

							Always stand behind the rope. Snap back zones are to be identified and kept clear. Use line runners to pay our ropes if available. Use of required PPE (gloves, lace-up safety boots, overalls, lifejacket, hard hat with chin strap, safety glasses). Be prepared to cut away ground line if entanglement occurs.				

2.3 Health and Safety Risk Assessment

Activity	Loading of equipment to vehicle											
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable / Tolerable / Acceptable
				P	S	R		P	S	R	
1.	Lifting < 50 kg	Personal injury	Lost time injury	3	4	12	Tested, certified and inspected lifting equipment only. Trained, certified and qualified lifting operators only. Tool Box Talk. Lift Plan. Use of appropriate PPE. Use of Banksman Use of Tag lines. Never stand underneath load or between a fixed structure and load.	2	4	8	Tolerable
2.	Lifting > 50 kg	Personal injury	Injury / fatality	3	5	15	Use pallet lifter, forklift or harbour crane. Use of appropriate PPE (gloves, steel toe footwear). Never stand underneath load or between a fixed structure and load.	2	5	10	Tolerable
3.	Vehicle weight capacity	Over-loading vehicle	No Injury	3	1	3	Distribute weight equally. Weights of items are known and total weight can be verified. Verification of vehicle payload weight from equipment requisition form. Ensure two drivers.	2	1	2	Acceptable

Activity	Loading / unloading of equipment to vessel											
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable / Tolerable / Acceptable	
				P	S	R		P	S	R		
1.	Embarking / disembarking vessel.	Falling into water. Falling onto another vessel alongside. Hypothermia. Drowning.	Injury /fatality.	3	5	15	Do not join or disembark vessel until vessel is tied up securely and authorisation is given. Vessel access and egress points to be made known to all personnel new to the vessel. Consider vessel motion in harbour (vessel pitch and roll). Man overboard procedures to be outlined within the vessel induction. Always have three-point contact when on ladders and gangways. Ensure that all safety barriers are fitted on the vessel. Ensure all spills are clearly marked and spill kit is used to remove liquid from floors and decks. Ensure all wiring and other trip hazards on deck are protected, covered or removed. Use of required PPE (gloves, lace-up safety boots, hard hat with chin strap, overalls, lifejacket, safety glasses).	2	5	10	Tolerable	
2.	Manual handling of items to and from vessel.	Poor lifting posture. Dropping weight onto feet or another person. Crushing injury. Falling, slipping.	Musculoskeletal injury. Loss of equipment to the water. Lost time injury. Damaged equipment.	2	4	8	Assume correct posture and procedures for lifting. 25 kg maximum lift per person. Do not step across on to vessel carrying a load. When weight exceeds 25kg, pair up with a colleague or use mechanical means (HIAB/ Forklift). Use lifting bags to transfer equipment.	1	5	5	Acceptable	

Activity	Loading / unloading of equipment to vessel											
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable Tolerable Acceptable
				P	S	R		P	S	R	
							Small items such as laptops and personnel bags may be hand carried or past across to vessel. Use crane to load equipment on to the vessel rather than manual handling whenever possible. Review the Lift Plan for loading from quayside to vessel. All vessel lifting equipment is inspected with in date test certification. Trained and competent hiab operators at all times are required. Never stand directly underneath a load. Never stand between load and vessel / shore structures. All loads are to be kept as close to the body as possible ensuring good body posture is maintained. Plan the route to prevent contact with possible tripping hazards. All Partrac personnel have completed manual handling training. Use of required PPE (gloves, lace-up safety boots, overalls, lifejacket, hard hat with chin strap, safety glasses).				

Activity	Loading / unloading of equipment to vessel											
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable / Tolerable / Acceptable
				P	S	R		P	S	R	
3.	Rigging Operations.	Incorrect rigging leading to falling objects. Crushing injuries. Damage to equipment.	Lost time injury. Injury / fatality. Damaged equipment.	2	5	10	Trained and competent personal select the rigging equipment. A lift plan is to be prepared which details the rigging methodology and selected rigging equipment. All rigging to be utilised for lifting operations is to be inspected and certified safe for usage as per LOLER regulations. Colour coding of equipment rigging equipment as per the inspection and certification process. A final inspection is to be performed of the rigged load, to ensure the load is rigged correctly. All defected equipment is to be quarantined immediately. Use of required PPE (gloves, lace-up safety boots, overalls, lifejacket, hard hat with chin strap, safety glasses).	2	5	10	**Tolerable**
4.	Lifting operations using hi-ab	Failure of lifting equipment. Personnel falling, or slipping. Swinging weights.	Musculoskeletal injury. Loss of equipment to the water. Injury / fatality.	3	5	15	Review the Lift Plan. Tool Box Talk. Tested, certified and inspected lifting equipment. All lifting points of all items being lifted are certified. Colour coding of equipment rigging equipment as per the inspection and certification process. Ensure crane is certified Trained and competent Riggers, Banksman and Crane operators.	2	5	10	**Tolerable**

Activity	Loading / unloading of equipment to vessel											
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable Tolerable Acceptable
				P	S	R		P	S	R	
							Use of Tag lines. Personnel to be alerted (verbally) and moved away from the lifting operation by Banksman. General public to be made aware of lifting operations if in the vicinity through verbal communication. Ensure general public do not walk along quay wall in the vicinity of the works during lifting operations. This is to be achieved through verbal communication. Ensure that heavy loads are placed within the operational zone of the hydraulic crane. Load at or near high tide for heavier items if required. Never stand underneath load or between crane and side of vessel or within the path of a load being lifted. Ensure vessel is stable before any lifting operations commence – beware of waves from passing vessels. Review weather before performing any lifting operations. Beware of wind gusts. Vessel hiab reach vs load capacity to be confirmed with the vessel operator before loads are lifted. Loads to be lifted slightly off the ground as a trial lift before the full lift can be performed. Reset the lift if it appears unstable. Assess the load weight and its impact below if dropped (for example damage to the vessel).				

Activity	Loading / unloading of equipment to vessel										
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable / Tolerable / Acceptable
				P	S	R		P	S	R	
							Use of required PPE (gloves, lace-up safety boots, overalls, hard hat with chin strap, lifejacket, safety glasses).				

Activity	Setting up / commissioning of equipment on board vessel										
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable / Tolerable / Acceptable
				P	S	R		P	S	R	
1.	Set up of electrical survey equipment.	Electrocution.	Injury / fatality.	3	5	15	All equipment to be utilized is to be CE marked and manufactured to a European standard. All portable electrical appliances are PAT tested with evidence of certification. All cables and hoses are to be routed as safely as possible to prevent tripping hazards. Keep all electrical equipment indoors where possible. Use weather-proof extension cables and boxes to cover multi-plugs and connections. Power down all equipment before disconnecting. Mandatory PPE must be utilized at all times (flame retardant overalls, lace-up safety boots, matting).	2	5	10	Tolerable

Activity	Deployment / recovery of equipment											
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable Tolerable Acceptable	
				P	S	R		P	S	R		
1.	Assessment of weather and sea conditions.	Sea and weather conditions leading to unsafe operations, including weights and frames swinging around when lifted.	Injury / fatality. Damage to equipment. Damage to vessel. Incorrect equipment deployment. Loss of equipment.	2	5	10	Review weather forecasts with vessel skipper and project personnel. Review forecast with Port Authority. Assess conditions before departing for site. Re-assess conditions on site. Vessel skipper to have ultimate control over Go/No Go based on site conditions. Do not commence operations if in doubt.	1	4	4	**Acceptable**	
2.	Positioning of the load prior to deployment.	Crushing or landing on personnel.	Injury / fatality. Damage to equipment. Damage to vessel.	2	5	10	Use crane/HIAB. One sole person in charge of the lift ('Banksman'). Ensure good communication between banksman, crane operator and crew. All personnel operating crane/HIAB are to be trained and competent. Never stand underneath load or between a fixed structure and load. Verbal and hand signal communications between banksman and crane operator. At any point throughout all operations, if the situation is to begin to go wrong or any person may be at risk an 'All Stop' must be voiced. This can be performed by any person. The vessel stability is to be taken into account during any lifting operation, due to the possibility of the vessel listing during hoisting. Continuous monitoring is to be	1	5	5	**Acceptable**	

Activity	Deployment / recovery of equipment											
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable Tolerable Acceptable
				P	S	R		P	S	R	
							performed to ensure safe lifting parameters is maintained (wind speed, swell etc.). All personnel are to remain at a safe distance during all lifting operations. Tag lines are to be utilised to control the load and manoeuvre the load from a safe distance. Use of mandatory PPE (gloves, lace-up safety boots, overalls, lifejacket, hard hat with chin strap, safety glasses).				
3.	Lifting equipment over or in board.	Swinging of equipment leading to crushing against side of vessel.	Injury / fatality.	3	5	15	Never stand underneath load, between a fixed structure and load or in the path of a load being lifted. Use taglines to steady the load, releasing lines before the load enters the water. Ensure good communication between banksman, crane operator and crew. All personnel are to remain at a safe distance during the deployment and recovery operations. Use of required PPE (gloves, lace-up safety boots, overalls, lifejacket, hard hat with chin strap, safety glasses).	2	5	10	**Tolerable**
4.	Lifting equipment.	Struck / crush.	Injury / fatality	3	5	15	Tested, certified and inspected lifting equipment only. Trained lifting operators only. Use of Banksman. Use of Tag lines. Tool Box Talk. Lift Plan.	2	5	10	**Tolerable**

Activity	Deployment / recovery of equipment											
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable Tolerable Acceptable
				P	S	R		P	S	R	
							Never stand underneath load or between a fixed structure and load. Use of required PPE (gloves, lace-up safety boots, overalls, lifejacket, hard hat with chin strap, safety glasses).				
5.	Paying out mooring line during deployment.	Entanglement with persons.	Injury / fatality.	3	5	15	Tool box talk. Buddy system. Trained, competent personnel only. Ensure rope is in a 'reducing figure of eight' formation to allow free run. Never stand in the bight of the rope. Always stand behind the rope. Snap back zones are to be identified and kept clear. Use line runners to pay our ropes if available. Use of required PPE (gloves, lace-up safety boots, overalls, lifejacket, hard hat with chin strap, safety glasses). Be prepared to cut away ground line if entanglement occurs.	2	5	10	Tolerable
6.	Deployment or recovery of ground weight.	Crushing or landing on personnel.	Injury / fatality.	3	5	15	All non-essential personnel to clear deck. Only trained and competent personnel to operate hiab. Listen to crane operators at all times. Never stand underneath load or between a fixed structure and load. Coil up lines so they prevent possible tripping hazards. Load cells are not required.	2	5	10	Tolerable

Activity	Deployment / recovery of equipment											
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable Tolerable Acceptable
				P	S	R		P	S	R	
							Pitch / heave of the vessel is to be taken into account, to ensure safe deployment is maintained. All personnel are to remain at a safe distance. Tag lines are to be utilised to control the swing of the load. Use of required PPE (gloves, lace-up safety boots, overalls, lifejacket, hard hat with chin strap, safety glasses).				
7.	Entanglement with fishing gear.	Deployment or recovery lines snagged in fishing gear. Vessel becoming snagged as a result.	Lost time / damage.	3	2	6	Notice to mariners issued prior to operations being undertaken. If fishing activity is being undertaken in the location then discussion with the fishing vessels is required before work can take place. If the equipment becomes entangled with fishing gear on recovery, the gear is to be cut away and the local authorities advised. Guidance on the most appropriate course of action is ultimately the responsibility of the vessel skipper.	2	2	4	**Acceptable**
8.	Recovery winch rope snapping under load.	Rope snapping back and striking crew.	Injury.	3	4	12	Certified lowering wire, rope and shackles. Breaking strain of ground line is known. The ground line will be passed through the capstan guide, disconnected from buoyancy unit and transferred to the capstan with 3 or more turns. The ground line will then be slowly taken up to tension using the crane, and further tension slowly applied when the weight of the frame comes onto the ground line.	2	4	8	**Tolerable**

Activity	Deployment / recovery of equipment											
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable / Tolerable / Acceptable	
				P	S	R		P	S	R		
							Personnel to stand out of line of rope under tension. Use of required PPE (gloves, lace-up safety boots, overalls, lifejacket, hard hat with chin strap, safety glasses).					
10.	All works on board the vessel whether moored alongside or at sea.	Man over board.	Injury / fatality.	3	5	15	Guard rails to be kept in place at all times apart from when equipment is being deployed/recovered. If within 1m of open back deck harness must be worn. Replace guard rails at earliest opportunity. Use of 275KN life Jackets. No lone working. Day light working only. Mullion suits to be worn on back deck if water <10degs Celsius.	2	5	10	**Tolerable**	

Activity	Deployment / recovery of equipment											
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable Tolerable Acceptable
				P	S	R		P	S	R	
11.	All works on board the vessel whether moored alongside or at sea.	Fire on board vessel leading to asphyxiation and/or severe burns.	Injury / fatality.	3	5	15	Ensure vessel induction is completed for all new personnel to vessel. Fire fighting equipment should only be operated by trained personnel (vessel crew and skipper). Basic First Aid Training. On seeing a fire, raise the alarm as detailed in the Vessel Induction. Vessel skipper and crew are responsible for tackling fires. All other personnel on board to go to Muster Stations as directed and if safe to do so. If Skipper requires further personnel to assist with fire-fighting, personnel are to follow the instructions given. Use of required PPE (gloves, lace-up safety boots, overalls, lifejacket, hard hat with chin strap, safety glasses).	2	5	10	Tolerable
12.	All works on board the vessel whether moored alongside or at sea.	Multiple engine failure or other mechanical failure on vessel. Vessel adrift at sea.	Injury / fatality. Catastrophic equipment damage.	2	5	10	In the event of both engines failing, the coastguard and local vessels will be contacted to obtain assistance (via HF radio or satellite phone communication). Vessel captain will issue all commands and will direct all staff as and where required. Ensure that life jackets are worn by all personnel. Vessel to anchor if appropriate. All personnel to have completed STCW 95 Personal Survival Training.	2	5	10	Tolerable

Activity	Deployment / recovery of equipment										
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable / Tolerable / Acceptable
				P	S	R		P	S	R	
13.	Survey operations.	Weather deterioration during survey work. Personnel knocked around on deck.	Injury.	3	4	12	Weather forecasts will be obtained prior to leaving harbour and monitored thereafter. If weather conditions exceed the maximum workable conditions, all work will be halted and the vessel will return to port.	2	4	8	Tolerable
14.	Survey operations.	Working outside of daylight hours. Sea fog / low cloud.	Injury / fatality	2	5	10	Only operate during daylight hours. Ensure vessel radar is operable. Wait until fog clears if time permits.	1	5	5	Acceptable
15.	Survey operations.	Other vessel traffic / water users in the area.	Collision	2	5	10	Advise port of daily operations. Ensure HF radio communications are working on the vessel. Keep a look out for other marine traffic. Do not work in darkness or poor visibility (fog).	1	5	5	Acceptable
16.	Recovery of all deployed materials.	Hazard to fishing equipment. Loss of equipment.	Minor environmental impact. Non-compliance with ISO14001.	2	2	4	Use of appropriately certified equipment able to withstand many months at sea. Design of system has been thoroughly tested. All positions recorded to within +/- 5m. All safe working practices / controls will be adhered to and followed.	2	1	2	Acceptable

Activity	Security Risk										
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable / Tolerable / Acceptable
				P	S	R		P	S	R	
1.	Preparation of equipment on quayside. Loading and unloading of vessel. Deployment and Recovery operations.	Threatening behaviour targeted at personnel, equipment and vessel.	Personnel confronted. Potential lost time injury. Damage to equipment and vessel, including deployed instruments and equipment	3	4	12	Security Training during mobilisation in Aberdeen. Guard vessel on-site 24x7. Quayside security including meeting of vessel when arriving in harbour. Police and Coastguard consulted.	2	4	8	Tolerable

2.4 Environmental Risk Assessment

Activity	Environmental Risk Assessment										
Item	Task	Hazard	Consequence	Initial Risk			Control Measures	Residual Risk			Unacceptable / Tolerable / Acceptable
				P	S	R		P	S	R	
1.	Recovery of all deployed materials.	Hazard to fishing equipment. Non-compliance with ISO14001. Company policy.	Minor environmental impact	2	2	4	Use of appropriately certified equipment able to withstand many months at sea. Design of system has been thoroughly tested. All positions marked to within +/- 5m.	2	2	4	Acceptable
2.	Fuel & oil spillage.	Spillage to the sea. Fire hazard.	Environmental impact	3	2	4	Managed by vessel operator according to MARPOL (1973) regulations (annexes	2	2	4	Acceptable

							1-4). Personnel to alert vessel skipper of all spills and observations of any slicks from the vessel.				
3.	Disposal of batteries.	Battery leakage to the environment.	Minor environmental impact	2	2	4	All batteries are kept and returned to Partrac's warehouse in Glasgow. Batteries are disposed of by 'BatteryBack plc' and the according documentation provided.	2	2	4	**Acceptable**
4.	Lost equipment	Lost overboard or through recovery failure.	Loss of equipment	2	2	4	Use of appropriate, certified and tested equipment. Experienced personnel. Experienced procedural methods.	2	2	4	**Acceptable**
5.	Exposure	Rain/snow, sea spray, cold/hot weather, wind, large waves	Operative experiences extreme cold, wet, hypothermia, sun burn, sea sickness.	3	3	9	Use of appropriate PPE minimises exposure to conditions including waterproof jacket and trousers, overalls, gloves, hard hat, safety glasses; and warm clothing under overalls in cold weather. Avoid sunburn through use of sunscreen. Upon signs of sea sickness ensure operative notifies Party Chief/Vessel Master, stops work and rests (at position in vessel with least movement if possible), drinks fluids when possible to re-hydrate.	1	1	1	**Acceptable**

2.5 Party Chief's Responsibilities

The Party Chief has the responsibility to ensure that:-

- All work is carried out in accordance with this RAMS document.
- Correct PPE is being worn by all members of the deck party during all work operations on board the vessel and at the quayside.
- Guard rails are in place during transit to site.
- Safety checks are carried out on equipment deployment lines to ensure free entry into the water.
- All lifting equipment must be certified. All lifting equipment tested and prepared prior to departing the quayside.
- Tool Box Talk and Lift Plans carried out prior to operations, with specific instructions on personnel positioning during lift operations.
- Weather forecast to be obtained prior to operations and monitored during the course of the works.

2.6 Maintenance and Monitoring of Control Measures

- Review Risk Assessment prior to work commencing and re-state all the risks to all personnel involved.
- Ensure PPE is well maintained and serviced, prior to field work.
- No lone working on site - a minimum of two staff present at all times.
- Minimum one trained First Aider present.
- Tool Box Talks and Lift Plans to be conducted prior to any operations.

2.7 PPE Requirements

Each person must have the following Personal Protective Equipment (PPE). Check your equipment. Ensure that all lifejackets are in date and you are satisfied that they have been tested.

Item Number	Description	Issued in standard kit?
1.	Lifejacket	Y
2.	Hard-hat	Y
3.	Steel-toe capped boots	Y
4.	Waterproofs	Y
5.	High visibility vest	Y
6.	Overalls	Y
7.	Gloves	Y
8.	Eye protection	Y
9.	Harness	N

2.8 Emergency Contacts

Company /Organisation	Name / Position	Phone	Mobile	E-mail
Partrac	Peter Wilson – Director HSE	0141 202 0644	07793 249080	pwilson@partrac.com
Partrac	Sam Athey – Project Director	0141 202 0644	07748 904766	sathey@partrac.com
Partrac	Saul Reynolds – Party Chief	0141 202 0644	07876 560141	sreynolds@partrac.com
Partrac	Office	0141 202 0644		info@partrac.com
Client				
Vattenfall	Zoe Roberts – Project Manager	0203 301 9113	07814 444680	zoe.roberts@vattenfall.com
Vattenfall	Gary Mardell – Client Representative		07426 855 699	garry@consultonsea.com
Vattenfall	Marine Coordinator	01224 984906	07976 439411	aowf.marinecoordination@vattenfall.com
Vattenfall	AOWF VHF Private Channel: Frequency 157.45000 MHz			
Vessel Operator				
Ness Offshore	Robert Inkster - Director		07759 214743	rinkster@nessoffshore.co.uk
Ness Offshore	George West - Director		07919 118694	geo.west@nessoffshore.co.uk
Ness Offshore	Rover Alpha – Vessel		07438 820701 07759 214743	roveralpha2@gmail.com
Other				
Aberdeen Port Office	Administration	01224 597 000		info@aberdeen-harbour.co.uk
Aberdeen Royal Infirmary (A&E)	Foresterhill, Aberdeen AB25 2ZN	0345 456 6000		

3. SIGNATORIES

Each person in the Survey Team including the vessel skipper and all crew must read and sign this Risk Assessment prior to commencement of mobilisation.

I understand the risks involved as described throughout this document for the activity described in Section 1 (Method Statement) of this document.

Any further risks not identified prior to survey will be outlined in the Toolbox Talks, for which further signatures will be required.

Updates to this documentation may be requested via the Project Director Sam Athey (Partrac Ltd).

Person (Print name)	Position	Signature	Date
Saul Reynolds	Party Chief		
Ross Flatman	Marine Survey		
	Marine Survey		
	Client Representative		
	Vessel Skipper		
	Vessel Crane Operator		
	Vessel Deck Hand		
	Vessel Deck Hand		