EI 3595

G+ Marine coordination good practice guidelines

G+ Global Offshore Wind
Health & Safety
Organisation

In partnership with

energy institute

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Acronyms for 'offshore safety and emergency management' (OSEM) and 'offshore workforce management system' (OWMS) removed from 1.2 and annex B.

G+ MARINE COORDINATION GOOD PRACTICE GUIDELINES

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FOREWORD

The offshore wind industry operates in some of the most challenging and dynamic environments, where effective coordination of marine activities is critical to ensuring the safety and efficiency of operations. As projects scale in size and complexity, the role of Marine Coordination has become increasingly central, not only to project delivery, but to the protection of life and the safeguarding of assets.

This *G+ Marine Coordination good practice guide* has been developed to support offshore wind developers and other industry stakeholders in understanding and implementing robust Marine Coordination systems. It draws on lessons learned across multiple jurisdictions, input from experienced practitioners, and alignment with recognised health and safety frameworks.

The scope of this guide includes principles and practical considerations related to Marine Coordination during the construction, commissioning, operation and maintenance and decommissioning phases of offshore wind farms. It outlines the organisational, technical, and procedural elements necessary to manage offshore personnel, vessel movements, and communication systems effectively.

By promoting a shared understanding of good practice in Marine Coordination, this guide aims to contribute to the continuous improvement of health and safety performance across the sector. It is intended to complement existing regulatory requirements and internal procedures, providing a flexible yet comprehensive resource that can be adapted to the specific needs of individual projects and organisations.

1 INTRODUCTION

1.1 WHY MARINE COORDINATION?

1.1.1 Duty of care

Regardless of where a project is based in the world, the developer/operator of a site will have a 'duty of care' to protect those who work on the offshore wind farm (OWF). The regulation, in most countries, is that there will be accountability placed on the developer/operator. In addition, there are also several examples of Client companies in Oil and Gas being severely impacted by their subcontractor's incidents.

Duty of care is about individual well-being, welfare, compliance and good practice. Everyone has a duty of care, a responsibility, to make sure that they and other people are safe in the workplace. If you are an employer, you have the main responsibility for the health and safety of everyone in your workplace, including contractors, subcontractors and visitors. This is your 'primary duty of care'.

The coordination of activities offshore is the primary means by which the site operator follows their 'duty of care' to ensure compliance with safety in operations offshore.

1.1.2 Legislative

Legislative requirements may vary depending on where you are globally. That said, there will always be requirements, either globally by the International Maritime Organization (IMO), or nationally within individual Country Legislative Acts, Requirements, Recommendations and Good Practice Guides. The purpose of this document is not to delve deep into every requirement globally, but to describe what is seen as good practice, an example of such could be the *G+ Good practice guidelines for the management of small service vessels used in the offshore wind industry* (3rd edition, p. 24), where it states ***'The site management should establish a Marine Coordination function to oversee all marine operations in the wind farm, provide information to service Vessel Masters, and coordinate an emergency response to any incident within the wind farm.'***

Severity of the risks in working offshore that may need to be mitigated against:

- Interference between operations leading to a vessel collision, allision or another incident – simultaneous operations (SIMOPS).
- Vessels working near each other.
- High volume of personnel working offshore, including who they are, who they are employed by, what tasks they are doing and where they are located.
- Interference by a third party – vessels (not including OWF vessels) working near or encroaching into the OWF.
- Inefficient use of assets – operational control adds to the usefulness of mobile assets, thus reducing exposure to incidents.
- Incoming environmental exposures (lightning, wind and wave). The activity details are covered further on in 1.2 (monitoring of prevailing and forecast weather).

1.2 WHAT IS MARINE COORDINATION?

During all phases of an OWF life cycle, (development, construction, operations and decommissioning) marine activities and personnel movements offshore are a significant part of offshore operations. Aviation is also a component of the Marine Coordination control room.

Marine Coordination is a key part of maintaining safety to personnel, the environment and vessels contracted to an OWF. This is carried out by following site specific procedures set out by individual OWFs such as Marine Coordination procedures, emergency response procedure, emergency response cooperation plan (ERCOP) etc. Marine coordinators responsibilities include tracking of contracted offshore vessels and their crew's/passenger's whereabouts and certification using a selected vessel tracking monitoring system (VTMS) and personnel certification monitoring system. Marine Coordination is executed by a team of competent marine coordinators (competency, training and location will be discussed separately in section 2), who are classified as key members of the project management team, who have several key functions within offshore operations and the safety regime on the OWF. However, for clarification, this does not indicate that the Marine Coordination function is a job title or separate role. In reality, in certain organisations, Marine Coordination is a function of the control room team. The size of team varies from project to project; factors contributing to team size are the size and phase of the OWF and the number of vessels/persons on site. OWFs operated as a centralised hub are multiple wind farms operating under one umbrella. The team of marine coordinators is determined by site management. The size of team and competency level required by the marine coordinator should be in line with the size and workload of the project/how the site management see fit. Training on VTMS and personnel tracking systems should be supplied before starting a project. If the project is already running, then on the job training by an approved, competent Marine Coordinator should be provided in the form of a site-specific competency pack or similar.

Functions of Marine Coordination include:

- Being the point of control for access to the site, movement around the site and access to assets within the site.
- The coordinator is responsible for ensuring direct communications with Vessel Masters with regards to personnel on board (PoB), access to site, movement around site, approaches to assets and transfer of personnel.
- Tracking of vessels on the OWF and ensuring all records are in the logbook.
- Ensuring the correct people are on the correct vessels.
- Maintaining situational and people location awareness on the site.
- Utilising provided systems, such as electronic charts, IT applications, plans and manifests from site, direct communications with site and Vessel Masters, weather forecasts, etc.
- The coordinator will be the most up-to-date person on site regarding what is happening and the location of all personnel on site at any time.
- Tracking of all persons on the OWF.
- Ensuring everyone on site has the necessary competency and access rights to be on the OWF and to access certain assets.
- Monitoring of avoidance systems:

- Monitoring of avoidance systems:
  - Utilising all IT systems at their disposal, as well as direct dialogue with Vessel Masters on site, keeping an update status and awareness of all available avoidance systems, such as demarcation buoys, navigation lights, traffic corridor lighting, etc. (i.e., aids to navigation (AtoN)).
  - Regular status and/or defect reporting.
  - Monitoring signalisation equipment, e.g. signalisation buoys. In the case of floating offshore wind structures (FOWS) monitoring, all equipment is in place and if any of the equipment moves out, need to activate the correct Emergency Response Plan (ERP).
- Emergency response:
  - Execution of the OWF ERP in the event of an incident on site.
  - Coordinating site assets to enable a swift first line response:
    - Acting as front-line responder in control of offshore response.
    - Activating the dedicated local emergency response team.
    - Liaising with external agencies to assist in any response where necessary or where obliged to do so. For example, the local coastguard or emergency response organisation for the country in which the project is located.
  - For further information on emergency response guidance and assessments, refer to the *G+ Integrated offshore emergency response (G+ IOER): Good practice guidelines for offshore renewable energy developments.*
- Monitoring of prevailing and forecast weather:
  - Receiving and interpreting weather forecasts.
  - Issuance of weather forecasts to the vessels on the OWF.
  - Advising vessels and projects on changing weather conditions, in particular deteriorating conditions and severe conditions that could have an adverse impact on site and safety of life at sea.
- Managing live SIMOPS to prevent conflicts on the OWF:
  - Planned project activities should have already considered SIMOPS and the risks they bring. However, during normal daily activities, the coordinator will keep continuous awareness to identify when potential SIMOPS may arise due to unplanned activities, tasks being completed quicker or slower than expected leading to conflicts in access to certain areas on site and/or access to assets.
  - Liaising with Vessel Masters and personnel to keep SIMOPS to a minimum.
  - Advising the project management team of pending SIMOPS.
  - SIMOPS are to be managed in advance together with the Regulators and operations and maintenance (O&M) manager, depending on the type of SIMOP, since there is the need to approve the method statement (MS), risk assessment (RA) and then SIMOPS live management.
- Reporting:
  - Compiling and submitting reports, as required, for the project, management team and other internal/external stakeholders.
- Keep an overview of potential defects and restrictions on the asset (e.g. north gate broken and not approachable, davit crane defect etc.)
- Ensuring all permits for vessels and people are in place.

- Responsibility to set up and execute a yearly drill plan with the regulator coordinator and competent authorities.
- Management and monitoring of personnel and assets (craft, vessel, externals etc.) in the controlled areas.
- Command, control and communication (C3) capability (personnel, software and hardware) to maintain and advise situational awareness across all controlled areas and associated personnel.
- Identify primary communication structure and redundancy, as Marine Coordination is regarded as a safety critical system for both loss prevention and loss management, and prevent inhibited communications.
- Monitoring of weather in and around the specific OWF and nearby safe havens/ports and relaying weather information to project vessels and relevant parties.
- Producing and issuing informative Notice to Mariners to inform relevant authorities and local mariners of project activities that could pose risk to any person, vessel or the environment.
- Emergency response coordination – this includes liaising between vessel or person in distress and relevant parties, i.e. coastguard/emergency response team/site management, all in line with site-specific ERP where necessary.

1.3 WHEN TO UTILISE MARINE COORDINATION?

1.3.1 Development phase

In larger organisations, or where there are several developments in a region, the developer organisation has more of a need to understand and have available to them more information about what is happening on each of these sites. Neighbouring projects will inform the development teams when they have vessels out, the duration and number of personnel onboard. This results in each development knowing the details on the vessels in the site area at any time and they can share this information with the vessels that are offshore.

Coordination can be utilised with a basic, cost-effective approach, such as:

- The coordinator can ensure all persons on board the vessels are registered in the developer's system, so we know who and where people are.
- The coordinator can ensure that the vessels are entered into the developers' systems such that they can 'see' the vessel utilising the vessel's automatic identification system (AIS) transmitter.
- The coordinator can liaise with the vessel, when necessary, to ensure that the vessel has knowledge that someone is there watching out for them.
- The coordinator responds in emergency incidents as per the vessels ERP. They can have that interface with the local coastguard.
- The coordinator will only be active on behalf of the project for limited periods, not 24/7, as agreed with the project. However, they do have a 24-hour listening watch for emergencies. This is an effective approach when the developer may not even have permits in place for the OWF.
- In addition to managing simultaneous operations, as mentioned in preceding sections of this document, daily calls should be held with all vessels and request three-day forecasts to de-risk any conflicts.

1.3.2 The construction phase

The site extent will normally be marked by 'demarcation buoys', such that other mariners are aware that there is a 'construction site' there and that there may be specific regulations regarding the access to this area, or that there will be heavy activity in this area, with many vessels that will be restricted in the ability to manoeuvre and many hazards/risks to navigation in the vicinity.

All developers will utilise a full coordination service during this period, due to:

– The high level of activity.
– The types of activities from installation to commissioning, creating a significant number of different vessel types, restricted areas, increased hazards/risks, to the surrounding marine environment.
– Number of vessels and persons on the OWF will be at their highest level throughout the life cycle of the OWF.

Due to the high levels of activity the site will usually require coordination services 24 hours a day.

1.3.3 Operational phase (O&M/service)

During this phase, the OWF will be in its operational phase primarily with permanent site crew transfer vessels (CTVs) and depending on OWF size, service operation vessels (SOVs) with occasional additional vessels attending the site for various 'campaigns'. This occurs several months at a time, typically during the better weather months. During the operational phase:

– All developers will utilise coordination services during this period to assist with coordination in normal and abnormal (emergency) situations.
– Due to the low activity levels and planned maintenance regime, most of the workload is scheduled and usually only planned in for 12 hours a day. Hence, coordination services are not required for 24 hours and there would usually only be a call out service out of office hours. However, as sites become larger and are located further from shore, they are starting to move towards 24-hour operation.

1.3.4 Decommissioning

As a site reaches the end of its life, the OWF will need to be decommissioned and removed to allow the site to revert to its natural state, unless further construction is approved. This phase, as with the construction phase, will be a time of high activity, with the site being deconstructed in reverse of the original construction.

All developers will utilise coordination for this phase, dependent on the activity. Due to the high levels of activity the site will usually require coordination services 24 hours a day.

1.4 WHERE DO WE UTILISE COORDINATION?

In project

Historically, coordination was always a component of the OWF management team that operated on site, either at the onshore or the offshore site and has always been thought of as integral to the planning and the execution of the activities offshore. The following list shows the advantages and disadvantages, that might impact health and safety, for this approach. The intention of the advantages and disadvantages lists in this document is to guide developers to assess what is best for their specific projects/company.

The advantages include:

– good core competencies, and
– direct communications with site.

The disadvantages include:

– Starting new on every project - needs to be assessed.
– There is limited commitment to the developer.
– Lessons learnt are not taken forward.
– The number of contractors is limited.
– The exposure to emergency situations is limited.
– New training required on the specifc of the developer/OWF specifics, including systems.
– There are different emergency response set-ups.
– Most OWFs run with no spare capacity so if someone is ill or needs to have time off, there is nobody to cover the gaps, and the operator relies on the existing staff to make up the shortfall. This can cause fatigue and can lead to poor decision making.

In a regional hub

As developers grow bigger, they have more projects, and as offshore wind has developed the projects have got bigger. This has provided an incentive to centralise the Marine Coordination function. To have a larger team to oversee several OWFs, with shared resources, is particularly suited to a region where there is a long pipeline of projects in proximity:

The advantages include:

– Good overall competencies.
– Training regime to build on competencies and lessons learnt. Continuous professional development – improving knowledge and understanding, improving performance and awareness.
– Improved training regime widens the scope for recruitment away from just mariners, individuals based in similar industries can be trained, and due to the size of the team, are supported whilst gaining competency.
– More exposure to emergency situations improving standards in response.

– Standardised processes, taking onboard lessons learned from previous projects, delivered by coordinators who have learnt and developed local language.

The disadvantages include:

– Requires a strong pipeline of projects.
– Takes time to set up and gain competencies initially.
– Requires a larger centre for operations.
– Requires good connectivity to site.
– Marine coordinators are sanitised from the site and site operations.
– Greater likelihood of communication system failures than in a global hub.

In a global hub

As developers grow internationally, a global hub becomes a possibility. With improvements in communications, latency times and IT, having a globalised centre means the developer can take advantage of centralisation, using the lessons learnt and having a high performing department, which is efficient and effective.

The following factors influence the decision:

The advantages include:

– It is more efficient for the company.
– Increased safety through standardisation, improved training regimes, increased access to emergency response, increased utilisation of lessons learnt, greater continuous professional development of coordinators.
– Improved communications infrastructure.
– Ability to employ multicultural team, with additional languages to enable sustainability globally.
– Ability to respond quickly to projects globally, no requirement for local set-up.
– Ability to engage in all phases of an OWF.

The disadvantages include:

– Does not cater for local content in some countries.
– Takes time to set up and gain competencies initially.
– Requires a larger centre for operations.
– Requires good connectivity globally.
– Possibility of communication system failures. In both a regional and global set-up, backup provisions/procedures should be in place covering how coordination will be handled in case of communications failure.

1.5 ROLES AND RESPONSIBILITIES

1.5.1 Roles

Planning

This is the activity of being involved in the planning process prior to vessels going offshore, or for the next day's activities for vessels remaining offshore. The projects will usually have

planners, who plan all the activities, and the coordinator will usually prepare all the vessel manifests, check that all the personnel profiles are valid and ensure preparation for the next day's activities.

Coordination

The core role of the coordinator is to approve all the manifests, the personnel profiles and actively engage in all the coordination activities described. They also maintain management systems so the organisation can view live information from the OWF.

Reporting

During the delivery of their duties, the coordinator will collate all the necessary information and make reports ready for submission to the project, the data centre and the internal and external stakeholders. These reports can cover anything from number calls, transfers, activities, vessels on site, fuel usage, emissions, mammal observations, etc. They provide information that the developer requires internally for production data or as required externally under licence to the authorities.

Emergency response

The coordinator act as the front-line emergency responder, responding to any incident offshore, activating the organisational ERP and liaising with the appropriate internal and external assets or agencies to support the required response to said emergency.

1.5.2 Responsibilities

Health and safety

Personnel

The health, safety and tracking of personnel on the OWF are essential functions of the Marine Coordinator. The coordinator must know, at all times, where all the personnel are and validate in advance the companies where personnel are employed. This requires good communications between the site, the vessels, the technicians and the coordinator, wherever they are located.

In case of an incident or an emergency, all persons need to be accounted for.

Many developers will have a logging system that enables full location tracking, either automatically or manually by the coordinator, with their location being visible on the mapping part of the logging system.

The coordinator must double check the permit to work or other relevant safety document is being adhered to.

Notwithstanding the fact that Vessel Masters have the final say about the safety of their vessels and people on board, within the scope of the Marine Coordinator responsibilities, they have the final say and should not be overridden by other site/project personnel.

Assets

Mobile assets (vessels)

The safety and tracking of all mobile assets on the OWF is another especially important function of the coordinator. The coordinator must, at all times, maintain situational awareness of the location, purpose and tasks of all the mobile assets on site. A failure to do so could result in damage, injury, collision, allision causing a risk not only to said assets but also other

assets on the OWF or damage to the environment through pollution to the air or watercourse.

Particular attention of the coordinator is drawn to areas where significant SIMOPS are planned.

Many developers now utilise a tracking system that enables full location tracking and monitoring, utilising the AIS signals from the assets.

Marine Coordinators have ultimate control and consignment of dangerous goods and must notify the Master of the vessel if present.

Fixed assets

The safety of fixed assets on the OWF is paramount and must be protected at all times, such assets include offshore substations, wind turbine generators (WTGs), demarcation buoys, cables, etc.

The Vessel Masters must always liaise with the coordinator to ensure they gain approval to approach said assets. Therefore, the coordinator must always consider:

– Who has access rights to the asset?
– Is there a work permit in place enabling works to be carried out?
– Are the right technicians transferring to the asset?
– Are there any defects, damages or issues with the asset that prevents access to the asset?

Many developers will have a management system that enables tracking of who has access, work permits, defects and damages for assets to enable the coordinator to keep their awareness and prevent access when needed to do so.

Navigation

Navigational safety of an OWF and non-project related vessels is an important aspect of the Marine Coordination function.

Project vessels

Project vessels should be informed about all site operational procedures, including:

– procedures, protocols, processes to be followed on site, including reporting to and liaison with marine coordinator;
– communications channels and plans whilst on site;
– ERPs and actions needed in case of an emergency, and
– safety/restricted zones.

Non-project vessels

Non-project vessels should be informed about the site and any hazards/risks to vessels that approach and/or encroach on to site.

Notices to mariners should be issued on a regular basis to all key stakeholders and the authorities.

Project vessels and/or marine coordinator should broadcast regular warning to vessels in the vicinity of the OWF, particularly in the event that there are unplanned activities and/or temporary works that may not have been issued in a Notice to Mariners.

Although the Master of a particular vessel has the responsibility for the safety of their vessel and the persons on board, the marine coordinator has a responsibility to monitor all project

and non-project vessels ensuring they all comply with the information they have been given. Most developers now use a management system that can issue warnings to non-project vessels encroaching on the site or project vessels that encroach on restricted and/or safety zones.

This system allows the marine coordinator sufficient time to take the most appropriate action. For project vessels this would normally be speaking to the vessel directly and for non-project vessels speaking to the vessel directly or indirectly through the project guard vessel. However, O&M sites tend not to use guard vessels. Construction sites do at certain stages. Guard zones/alerts for all vessels entering OWF areas/exclusion zones should be utilised.

Emergency response

All OWF projects will have an ERP. It is the Duty Holder's responsibility to ensure that they have the capability to effect emergency response. While Marine Coordination is essential to this capability, accountability cannot be delegated externally. Therefore, it is vital that emergency response team (ERT) internal members are familiar with offshore emergency management and marine operations. However, it is the responsibility of the marine coordinator to ensure that they are not only fully familiar with the ERP, but that they are also fully familiar with the project and external resources that can be called upon in an emergency. This extends from a twisted ankle to a fire on board a vessel, to a vessel collision, to a repatriation of an injured person with a life-threatening issue. It is also important to understand that this includes environmental (ecology) issues/incidents, e.g. an oil spill. An environmental incident will also trigger third-party interaction by the marine coordinator.

External resources can be any resources from the local coastguard to resources from a neighbouring OWF (neighbouring developers will have an informal working agreement between each other). In the event of an emergency offshore, the marine coordinator will act as the front-line responder to the incident. The marine coordinator's level of experience will depend on their prior knowledge and exposure to previous incidents marine coordinators who work within a Hub, either regionally or globally, will have much more exposure to incidents, drills and exercises and therefore become more experienced in this area. The marine coordinator will activate the ERP, they will liaise with the OWF project team, with the local coastguard and request support from site and external resources if necessary. They will be the focal point in the project around which the response will be performed.

2 THE MARINE COORDINATOR

2.1 WHO CAN BE A COORDINATOR?

Traditionally, the marine coordinator has been an individual who was a competent mariner, usually with a master mariner's qualification; however, more recently this has been with 'restricted' Certificates of Competency. To facilitate this, developers have frequently contracted coordinators on short-term contracts. These contractors have moved from project to project, particularly during construction periods, with local mariners for operational periods. As the industry has developed and grown, with developers building more OWFs, sometimes within the same region, the developers have moved away from 'coordination within the project' to 'coordination from dedicated centres' to take advantage of the benefits of centralisation, which has changed the specific need for competent mariners. Centralisation in 'Coordination Centres' has enabled the industry to widen the scope of recruiting to include the recruitment from a wider range of roles, predominantly still within the marine sector. This is due to centres covering more projects, being more long term and having greater time to train due the numbers of coordinators.

When looking into recruiting a marine coordinator, the organisation needs to look at various considerations:

- Period coordination needed (time): construction period (2-5 years), operational period long (20+ years);
- Complexity: construction period complex, operational period not as complex;
- Costs: construction period variable, operational period controlled fixed;
- Local content: construction period less likely, operational period highly likely (native speaking marine coordinators to be considered);
- Location: construction period availability issues, operational period longevity of employment, and
- Regulation: construction and operational periods very location specific.

2.2 TRAINING AND DEVELOPMENT

All developers should ensure that they have a:

- Training plan:
  - A training plan will define the objectives, content, and structure of a training programme. It includes details such as the training goals, target audience, training methods, resources, timelines, and evaluation methods.
  - The plan should be adaptable to meet the needs of every employee, whether an employee is fully or partially competent, incluuding those with no skills or experience in the role.
  - Awareness of G+ good practice, IMCA (International Marine Contractors Association) reports, MCA (Maritime and Coastguard Agency) M-notices (or similar, depending on country) is crucial to the role to ensure Marine Coordinators are up to speed with any previous incidents and safe practices.

  - In the UK, the MCA Offshore Search and Rescue (SAR) Course is a beneficial course for Marine Coordinators to be trained and made aware of the correct procedures and processes to be followed in SAR situations and other emergencies. It is hoped that similar courses will be developed globally, if not already available. Please contact G+ to obtain the course syllabus. Other suggested training includes crisis management training (CMT) and emergency response. Control room training is also recommended, either via a simulator/ virtual or through shadowing others.
  - Communication skill requirements should apply within the coordination team as handover during shift change can be critical with regards to information sharing.
  - Must be familiar with emergency management and be formally trained to identify types of incident categorisation, how to manage different types/tiers of incident and understand the doctrine of coordinating emergencies consistently.
- Continuous development plan:
  - A continuous professional development plan is used to find and record the learning and development of all employees. This could be to improve and develop their performance in their current role or to enable them to move into a new role.
  - Ongoing professional development should be specified, e.g. 120 hours (about 5 days) per year, where Marine Coordinators can log on and update their personal profile with details of the research carried out. They might include one hour spent reading the latest IMCA report, digesting the findings, forwarding on to the site vessels and detailing how any relevant findings could be implemented.

Dependent upon the developer's coordination strategy, the training and development process can be different.

2.2.1 Utilisation of coordination contractors

The contractor is a fully qualified and competent coordinator and may be utilised in the following ways:

- Training:
  - The contractor is responsible for ensuring they are fully qualified and competent in Coordination. Therefore, the developer has no commitment with regards to training, except for the project department/project onboarding and familiarisation.
- Continuous development:
  - The developer has no requirement to 'develop' the coordinator. However, there is always a benefit in assisting the contractor with their 'personal development', the benefit being that if they are long-term contractors, continuous development enables a more competent contractor, and the likelihood of retention increases where needed.

2.2.2 Utilisation of permanent employees

Upon recruitment, the Employee Coordinator may be:

- Fully competent:
  - Training – the employees require no training, only onboarding and familiarisation into the department/project.
  - Continuous development – as with all employees, the developer should invest in the employee. Continuous development is a must, and this also provides a further benefit of employee retention.
- Partially competent:
  - Training – the employee may have some industry background, either maritime, aviation, port, operational or organisational. Training will be different depending on their background and experience. Therefore, there will be selective focus on the various areas of coordination that it is clear the employee needs. This requires some significant effort from the department to ensure that there is clear focus from the employee and their trainer to ensure that the training is given at the correct level, at the right time and the progress is monitored.
  - Continuous development – as with all employees, the developer should invest in the employee. Continuous development is a must, and this also provides a further benefit of employee retention.
- Have no relevant skills.

The employee may be a trainee, from a different department in the organisation or a new employee with the right skill sets to succeed in the role. They will require:

- Training – the employee would be expected to complete the whole training plan. The programme should take them through each area of the role of a coordinator, with continuous monitoring, feedback, progress reporting and secured over a set timeline. The employee should have an assigned training/mentor, who will work with the employee to ensure they focus on their training, complete their training record and deliver to a high standard.

2.3 COMPETENCY

Depending on the complexity, Marine Coordinators should be able to demonstrate many competencies, not all of them being task related:

- Marine operations:
  - Vessel types and roles – the coordinator must understand the various vessel types, their roles, operational limitations and the activities performed on board.
  - Navigation – the coordinator needs to have a basic understanding of chartwork, navigational aids, bridge operations, etc.
  - Weather – the coordinator must understand weather reports and forecasts, interpreting how this will affect operations on site.
  - Communications – the coordinator must understand not only the hardware, but also how communications work on site such that they can not only effectively communicate with all vessels and personnel offshore, but they can also efficiently troubleshoot any issues/defects that may arise. The coordinator must have the relevant radiotelephony certification.

A global maritime distress safety system (GMDSS) certification is a requirement due to the quantity of radio communications.

  - Maritime Regulations and Conventions – the coordinator should have a reasonable working knowledge of the rules and regulations that govern working at sea, i.e. what governs the movement of vessels on the OWF.
- IT literacy:
  - Management systems – many developers will have a management system in place, which may include personnel data, planning and tracking solutions. The coordinator must be able to utilise such systems.
  - Office Software – the coordinator must be able to utilise standard office software to perform basic requirements of the role, to be capable of communicating not only verbally but digitally within the industry.
- Flexibility/adaptability:
  - Flexibility – the coordinator must be flexible enough to enable rapid changes in tasks, from standard administrative tasks to reacting to an emerging situation, for example.
  - Adaptability – the coordinator must be able to adapt, from dealing with project managers, to dealing with Vessel Masters, all with differing needs.
- Ability to maintain an overview:
  - Situational awareness – one of the key abilities of a coordinator is to maintain 'situational awareness' of what is happening on the OWF, i.e. they must keep awareness of where all vessel/personnel are on site, what activities are happening on site, any SIMOPS happening on site, upcoming work, activities around site (third-party vessels encroachment).
- Calmness/authority:
  - Calmness – the coordinator must have the ability to remain calm in demanding situations, e.g. as the front-line emergency response they must be able to react in such a way to project control over the situation.
  - Authority – the coordinator must have the ability to act with authority, to lead demanding situations, to hold difficult remote discussions and to direct those offshore.
- Competence through experience:
  - Knowledge:
    - Maritime – the coordinator must have some form of maritime insights, either directly or indirectly. A Master 200 GT/OOW Unlimited/Class 1 or 2 Fishing COC, (standard qualification for a CTV Master) was seen as an ideal transition to marine coordinator.
    - Supervisory – although not all coordinators will be formally supervisors, they need some experience in supervision due to the nature of the work – they are in essence supervising those offshore.
    - Emergency Response – the coordinator requires solid underpinning knowledge and experience in responding to emergencies. This not only includes the coordinators' role in an emergency, but having an overall good working knowledge of all active participants in a response, including that of the coastguards, including standard search patterns, resources available and interaction between agencies.

3 RESOURCING

When finding the numbers of coordinators needed for either a project or 'Centre', there are several considerations that must be made, including:

Location

On-project

If the resourcing needed is just for a specific contract and the requirement is to have the coordinator on-project, then location will then focus on whether the coordinator is to be based 'onshore' or 'offshore':

– Onshore – requirements would surround accommodation for the coordinator and any associated costs. This is usually borne by the contractor and daily rates would need to consider this. Thus, daily rates for the contractor may need to be enhanced.
– Offshore – requirements would depend on accommodation offshore, i.e. is there an accommodation vessel, either an SOV or jack-up vessel. Who coordinates the availability of this accommodation, where do the costs lie, etc.

Centralised hub

Usually for the recruitment of full time employees, however, there may be a mix of the type of coordinator. See section 4, 'staffing'. The benefit of utilising a centralised hub is that the developer can cover several either regionally or globally and take advantage of 'sharing' resources across the various projects, including the sharing of desks by projects, such that there is a much more efficient and effective use of the resources.

– For example, in the case of a regional hub encompassing all projects in a similar time zone, usually less work happens overnight compared to during the day. Consequently, a coordinator could look after one project during the day and two projects overnight. This decreases the overall number of coordinators required.

Combination

One coordination functions as corporate with the added utilisation of local Coordination Centres. This can be an optimal option for large organisations operating in varying time zones.

4 STAFFING

This section details examples of typical set-ups for coordination services, dependent on organisation size, requirements and strategy. These will include the typical set-up for a project or hub, including what could be the minimum requirement.

4.1 PLANNING

To determine what resourcing is required, the developer needs to understand the role and how much activity will be required within the specific phase of the project. For example, a project in construction will have a much higher level of resourcing required due to the high activity levels, with anything up to 40 vessels on site daily, compared to a project in operations that may have only one or two vessels. The developer also needs to understand the level of automation in vessel and personnel tracking, situational awareness and site protection (alarms).

4.2 FATIGUE MANAGEMENT

Fatigue can be linked with project phase and the developer should place care on reassessing the workload and reinforcing the team during critical maintenance phases, installation phases, or any other critical phase out of the day-to-day O&M. The developer needs to appreciate fatigue when determining the resourcing of the coordination services, this will include:

The size of the project

The larger the project, the greater the number of vessels and persons that will be present on site at any give time. There will be:

– more vessel movements;
– more personnel transfer, and
– more third-party traffic.

The larger the site, the greater the area for which the coordinator must maintain situational awareness.

The location of the project

Project close to shore generally have more third-party traffic navigating in or around the OWF. They require:

– greater focus of site protection, conflict management and situational awareness, and
– greater understanding of the direction of adjacent traffic.

Far shore projects

– less understanding of the direction of third-party traffic, and
– requires more focus on site protection.

Competency of coordinators

The following should be considered:

– Less competent coordinators will be historically working with higher levels of stress and will suffer fatigue more easily.
– Mix of different levels of competencies can lead to overloading some employees due to taking up the slack from less competent coordinators.
– Some marine coordinators involved in operations can lack a seafaring background and are primarily focused on coordinating switching activities and electrical/mechanical system tasks.

Absence

This can be anything from sickness to holidays and is a must when consideration is given to the level of resourcing. The developer must prepare an absence management plan to take account of:

– the different types of absence;
– the likelihood of absence, and
– the impact of absence.

Shift patterns

12-hour shifts are common and many control rooms are often staffed by one Marine Coordinator for the 12-hour period during light construction works. Therefore, it is imperative that welfare breaks, and facilities, are clearly defined with adequate staff cover always organised. During busy times offshore, additional marine coordinators are required to cater for the high volume of coordination meetings, SIMOPS and next day(s) planning daily, while in parallel managing the offshore logistics.

ANNEX A
COORDINATION EXAMPLES

Coordination – In Project in section 1.4 (Offshore)		
Phase	Construction	>
Coverage	12hrs	
No. coordinators	2	
Type coordinators	Consultants	
Shift pattern	0700-1900 14 on/14 off	
Costs (resources)	360hrs per month	
Software	Offshore Management System	
Communications	Very high frequency (VHF) x Terrestrial Trunked Radio (TETRA)	
Office set-up	1 x workstation Radio base station	

Project information

Coordination is performed offshore, where the coordination office and coordinators are based on either an SOV or accommodation vessel. Coordination is based on either 12-hour or 24-hour coverage. For a 12-hour shift, there would be one coordinator onboard for two weeks, when they are replaced by their opposite number who is currently off duty and at home. For a 24-hour shift then the number of coordinators would be doubled.

Due to the nature of this project, with no time to train, the coordinator will either be a fully trained full-time equivalent (FTE) (preferably) or a consultant coordinator hirer, in for a set period.

The coordinator would require some 'office space', with a minimum requirement of a desk, chair, two screens (one screen for Operations Management System (OMS) Map, other screen for administration), computer (plus ancillary equipment) and radio equipment based to enable coverage for TETRA and VHF. Depending on the size of the project (square miles) there would be a requirement for either hand-held radios or vessel base stations.

Cost impact to project:

If we utilise this as a base cost per coordinator, then utilising some base costs:

Facility –	based offshore on SOV or jack-up, therefore cabin and canteen facilities
Office set-up –	office on SOV or jack-up
Communications infrastructure –	sase station for VHF & TETRA
Coordinator –	two coordinators (contractors)

Coordination – In Project in section 1.4 (Onshore)	
Phase	Construction
Coverage	12hrs
No. coordinators	2
Type coordinators	Consultants
Shift pattern	0700-1900 14 on/14 off
Location	Site office
Costs (resources)	360hrs per month
Software	Offshore Management System
Communications	VHF x TETRA
Office set-up	1 x workstation Radio base station

Project information

Basically, the same as that based offshore, except that the office is based within the site office and any Consultants would have to find accommodation.

Coordination is performed onshore, where the coordination office is based in the site office. Coordination is based on either 12- or 24-hour coverage. For a 12-hour shift, there would be one coordinator on shift for two weeks, when they are replaced by their opposite number who is currently off duty and at home. For a 24-hour shift then the number of coordinators would be doubled.

Due to the nature of this project, with no time to train, the coordinator will either be a fully trained FTE (preferably) or a consultant coordinator hirer, in for a set period.

The coordinator would require some 'office space', with a minimum requirement of a desk, chair, two screens (one screen for OMS map, other screen for administration), computer (plus ancillary equipment) and radio equipment based to enable coverage for TETRA and VHF. Depending on the size of the project (square miles) there would be a requirement for either hand-held radios or vessel base stations.

Cost impact to project:

If we utilise this as a base cost per coordinator, then utilising some base costs:

Facility –	based in onshore site office
Office set-up –	requires minimum of desk, two screens, computer, phone
Communications infrastructure –	base station for VHF & TETRA
Coordinator –	two coordinators (consultants)

Coordination – local hub set-up	
Phase	Construction/operations
Coverage	24hrs
No. coordinators	2/4
Type coordinators	FTE
Shift pattern	12hr shifts x 7days on/7days off
Location	Regional site office
Costs (resources)	576hrs per month per project
Software	Offshore Management System
Communications	VHF x TETRA
Office set-up	3 x workstation Full radio set-up

Project Information

Coordination is performed onshore, where the coordination office is based in the 'site office'/ operations centre. Coordination is based on a 24-hour operational cycle. If there were three projects to be handled, then there would be 10 coordinators, generally three on duty during the day (one per project) and two on duty during the evening due to a lighter workload. This would make five coordinators per shift, 10 in total. The developer may wish to add more coordination to cover sickness and holidays, alternatively, this can be done by self-covering.

As mentioned, due to the nature of this HUB, it would be looking after several projects (construction and/or operations). Dependent on the number and type of projects, coordinators may be 'shared' between projects, thereby reducing the number of coordinators if every project were provided individually. Generally, there is a 20 % saving on resources per project.

Due to the number of coordinators, it is possible to engage in long-term training and development plans. Therefore, the coordinator does not need to be fully trained on day one. This enables the developer to follow a strategy of local recruitment of FTEs, replacing Consultants, which also gives longevity of employment for individuals and reduces costs of employment for the developer, approximately 35 % per coordinator.

There would be a requirement to set up a coordination centre, which would be more than just a basic office set-up for one project. Dependent upon how exchangeable the developer wants each desk to be, it will dictate how sophisticated the communications set-up needs to be. The IT platform would be web based and interchangeable.

There would need to be good connectivity between the centre and the sites, a temporary solution during construction and a permanent solution for operations.

Cost impact to project:

If we utilise this as a base cost per coordinator, then utilising some base costs:

Facility –	requires a centralised facility with access to radio communications, welfare facilities
Office set-up –	sufficient desks to cover each project, including computers, screens, phones
Communications infrastructure –	centralised communications infrastructure with access to each site
Coordinator –	four coordinators per project for 24-hours operations, desks may share projects

Coordination – centralised global set-up	
Phase	Construction/operations
Coverage	24hrs
No. coordinators	4 per project
Type coordinators	FTE
Shift pattern	12hr shifts x 7days on/7 days off
Costs	576 - 720hrs per month
Software	Offshore Management System
Communications	VHF x TETRA
Office set-up	1 x workstation per project Radio base station per project

Project information

Basically, this is the same as the HUB set-up, except for size and connectivity. Coordination is performed onshore, where the coordination office is based in a 'site office'/operations centre. Coordination is based on a 24-hour operational cycle. The total number of coordinators depends on the number and location globally of the projects. The developer may wish to add more coordination to cover sickness and holidays, alternatively, this can be done by self-covering.

As mentioned, due to the nature of this centre, it would be looking after several projects (construction and/or operations). Dependent on the number and type of projects, coordinators may be 'shared' between projects, thereby reducing the number of coordinators if every project were provided individually. Generally, there would be a 20 % saving on resources per project.

Due to the number of coordinators, it is possible to engage in long-term training and development plans. Therefore, the coordinator does not need to be fully trained on day one. This enables the developer to follow a strategy of local recruitment of FTEs, replacing Consultants, which also gives longevity of employment for individuals and reduces costs of employment for the developer, approximately 35 % per coordinator (dependent upon where the centre is located).

There would be a requirement to set up a Coordination Centre, which would be more than just a basic office set-up for one project. Dependent upon how exchangeable the developer wants each desk to be, it will dictate how sophisticated the communications set-up needs to be. The IT platform being web based and interchangeable.

There may be added costs involved, as expanding globally introduces cultural and language differences between the centre and the project. This can be overcome in several ways:

– Recruitment of local language speakers or provision of a translation service.
– Providing cultural training for cordinators and familiarisation prior to project start.

The need for good connectivity between the centre and the sites is paramount and a great deal of effort and testing needs to be done to find any latency issues.

Project information continued

There should be more than one screen, so the control room can be together with the surveillance room, depending on the size of the site. Therefore, the marine coordinator shall have present an online weather forecast, access to site sensors that can indicate sea state, wind speed etc, closed-circuit television (CCTV) cameras if any on site, access to a computerised maintenance management system (CMMS) or Marine Coordination software to ensure logbook feed. Normally, this software will have connection with marine traffic or vessel finder software and the coordinators also need to have access to global positioning system (GPS) placed in signal buoys, if present; therefore, at least four monitors are required.

Cost impact to project:

If we utilise this as a base cost per coordinator, then utilising some base costs:

Facility –	sufficient size and connectivity globally for each project served
Office set-up –	sufficient desk space for each project, view on noise and space
Communications infrastructure –	centralised communications solution
Coordinator –	minimum of four per project for 24-hour operations per desk, desks may have more than one project

ANNEX B
ABBREVIATIONS AND ACRONYMS

AIS	automatic identification system
AtoN	aids to navigation
C3	command, control and communication
CCTV	closed-circuit television
CMMS	computerised maintenance management system
CMT	crisis management training
CTV	crew transfer vessel
ERCoP	emergency response cooperation plan
ERP	Emergency Response Plan
ERT	emergency response team
FOWS	floating offshore wind structures
FTE	full-time equivalent
GMDSS	global maritime distress safety system
GPS	global positioning system
IMCA	International Marine Contractors Association
IMO	International Maritime Organization
IOER	integrated offshore emergency response
MCA	Maritime and Coastguard Agency
MS	method statement
O&M	operation and maintenance
OMS	operations management system
OWF	offshore wind farm
PoB	personnel on board
RA	risk assessment
SAR	search and rescue
SIMOPS	simultaneous operations
SOV	service operations vessel
TETRA	terrestrial trunked radio
VHF	very high frequency
VTMS	vessel tracking monitoring system
WTG	wind turbine generator

ANNEX C
REFERENCES

Global Offshore Wind Health and Safety Organisation (G+)

(https://www.gplusoffshorewind.com)

EI 3395 G+ Integrated Offshore Emergency Response (G+ IOER) Good practice guidelines for offshore renewable energy developments

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