



Credit: Ørsted

Offshore Marine Transfer Guidance

May 2023



Copyright

©2023 American Clean Power Association. All rights reserved. You may download, reproduce and print this white paper and any portion hereof (the “Document”) for internal use only (which use may include internal use by employees of your company), and, by downloading or accessing the Document, you agree: (i) that you shall not sell or otherwise engage in any distribution of this Document; (ii) that you shall not make any alterations, modifications, deletions or other changes to this Document without the express written consent of American Clean Power Association (“ACP”); and (iii) to indemnify and hold ACP harmless for any loss or damage, including reasonable attorney’s fees, that the ACP may incur, directly or indirectly, as a result of your use of this Document.

ACP assumes no liability for reliance on the contents of this document. ACP is providing this document for reference only in furtherance of ACP’s nonprofit and tax-exempt mission. ACP makes no representation or warranty about the information contained in this document, including, without limitation, the suitability of the information contained in this document for any purpose. It is offered only as general guidance and does not constitute legal, medical, or professional advice. This document is not intended to, nor does it, include information regarding safe operations and maintenance practices. Any recommended practices, guidance or standards contained in this document should be considered on a case-by-case basis and used in accordance with your company’s internal safety and other operating requirements as well as all applicable laws, regulations and recommended practices addressing safety and regulatory compliance (such as OSHA and ANSI requirements). You should consider seeking legal or professional advice on all matters concerning safety and regulatory compliance.

Contents

- 1. Introduction and Scope 1
- 2. Roles and Responsibilities.....2
- 3. Recommended Requirements and Decision Criteria2
- 4. Risk Assessment.....3
- 5. Training4
- 6. Communications4
- 7. Transfer from Crew Transfer Vessel (CTV) to Offshore Structure5
- 8. Transfers Between Vessels.....7
- 9. A4-4 Personnel Transfer Guidelines and Transfers using Walk to Work (W2W) Gangways.....9
- 10. Crane Operated Personnel Transfer Carrier and Use of Man Riding Baskets.....9
- 11. Boarding at Quayside10
- 12. Cradle Launch and Recovery and Davit Systems10
- 13. Other Methods.....10
- 14. Glossary and References11



1. Introduction and Scope

This guidance has been developed to provide a framework for how to execute safe transfer of personnel in the American Offshore Wind Industry. It is based on [G+ Offshore Wind Good Practice Guidelines \(GPG\) Wind Farm Transfer \(G+ GPG T\)](#) and the International Marine Contractor Association’s [Guidance on the Transfer of Personnel to and from Offshore Vessels and Structures \(IMCA Health, Safety, Security, and Environment HSSE 025, Lifting and Rigging LR 012, and Marine M 202\)](#), and indicates where further good practices or deviation is required in the American Offshore Wind Industry to provide a framework for how to execute safe transfers. This document also provides recommendations about the split of responsibilities within an organization to properly plan for and execute transfers.

Due to regular maintenance activity on wind farms, mobilizing personnel to Wind Turbine Generators (WTG), including those offshore, is a common activity. The intent of this guidance is that it be utilized as a basis for identifying suitable methods of transferring personnel in various functions while working in North American waters under an approved Safety Management System / Construction and Operations Plan (SMS / COP). The standalone transfer methodologies described in this Guidance align with best practices as defined in the referenced documents above. There may be situations where a company deviates from a given standard based on a risk assessment specific to an operation and/or task so long as the deviation achieves adequate risk reduction. It is critical when defining a transfer methodology that those planning the activities base their decision on a robust risk assessment process, ensuring it complies with U.S. regulations and their governing approved SMS.

This guidance takes into consideration the following transfer scenarios:

- Transfer from vessel to offshore structure
- Transfer between vessels
- Transfer using walk to work (W2W) gangways
- Identification of hazards and mitigation methods associated with marine transfers
- Protection against drowning, including a risk-based approach to the use of immersion suits
- Crane operated personnel transfer carriers and the use of man baskets for work over water
- Gangways, including motion compensated gangway
- Bridge or accommodation ladders

Personnel transfer to Floating Offshore WTGs, transfer by helicopter, use of an automated hoisting method and sliding access are not covered in this guidance. Further, this document is not intended to address emergency situations.



2. Roles and Responsibilities

The roles and responsibilities identified below and in the references are considered highly relevant and should be carefully considered when developing marine transfer methodologies in North America. It illustrates the split of responsibilities between various parties on a project. Wind farm operator management should be responsible for sourcing vessels that are compatible with boat landings and site conditions. The marine coordinator or operations manager should check predicted weather conditions against maximum weather criteria for making transfers prior to authorizing transfers on the wind farm, whereas the captain is always accountable for observing actual conditions on site and giving final permission for a transfer. The deckhands provide preparation, assistance, surveillance of immediate conditions and direct supervision for the safety of transferees. Each transferee has the right to stop a transfer if they feel it is unsafe. The responsibilities for each of the roles are described in detail in the referenced guidelines below.



G+ GPG T:

- 3.1 Supervisory/working arrangements
- 3.1.1 Responsibilities of wind farm or offshore substation operators and vessel charterers
- 3.1.2 Roles of vessel Captain, deckhand, and transferee

IMCA HSSE 025:

- 3.6.6 Responsibility

3. Recommended Requirements and Decision Criteria

The proper conditions and arrangements should be in place before attempting a transfer and these should be based not only on weather criteria, but also on the personnel and equipment involved and other factors as detailed in the references below. A planned Management of Change protocol as part of the SMS should be in place and used whenever conditions, equipment or methods are changed regarding transfers.

G+ GPG T:

- 3.1.3 Procedural arrangements

IMCA HSSE 025:

- 3 General Operating Procedures
- 3.1 Company Procedures
- 3.2 Minimum Requirements

4. Risk Assessment

Risk assessments should be made to cover each type of transfer on the offshore wind farm. It is important to analyze each task for hazards and each hazard for initial risk, control measures and residual risk. Every transfer operation should follow the individual company's approved procedure. These procedures should identify the necessary operating safety controls and preparations required, i.e., permit to work (PTW), risk assessment and toolbox talks (TBTs). They should clearly identify weather considerations, sea state limitations, and the roles and responsibilities of the personnel involved.

Control measures should be actionable items that can be understood and executed. Risk assessment should be structured in a cascading approach and the references suggest strategic at the company level, operational at the site and vessel level, and field risk assessment considering actual conditions (see IMCA HSSE 025 3.6).

G+ GPG T:

- 3.3 Hazards during specific activities
- Annex A 36
- A.1 Event tree – water entry
- A.2 Bowtie diagram – unplanned water entry
- A.3 Example transfer risk assessment
- Table 1 Hazards during transfers by stepping over to boat landing ladder
- Table 2 Hazards during vessel-to-vessel transfers
- Table 3 Hazards during W2W transfers
- Table 4 Average (50% survive) survival times (hours) for lightly clad males, from various authors (Golden and Tipton, 2002)
- Table A.1 Risk of falling into water
- Table A.2 Assumed distribution of occurrence sic of transfers in different weather conditions
- Table A.3 Risk related to water entry
- Table A.4 Range of the risk based on numbers from the Event Tree
- Table A.5 Example transfer risk assessment

IMCA HSSE 025:

- “All personnel transfers at sea, irrespective of the method, should be treated as a stand-alone operation and a formal risk assessment should be carried out beforehand by an appropriately trained person with the competence and experience corresponding to the degree/amount of risk under assessment.”
- 3.6.1 Strategic Risk Assessment
- 3.6.2 Operational Risk Assessment
- 3.6.3 Transfer/Field Risk Assessment
- 3.6.4 Risk Assessment Factors

Readiness check:

- Appendix 1 International Maritime Organization (IMO) [Guidance on Safety When Transferring Persons at Sea.](#)

5. Training

All transferees should have training and medical clearance before conducting transfers, such as [Global Wind Organization \(GWO\) Sea Survival Module of the Basic Safety Training Standard](#) or on-site training. There should be a familiarization with the site-specific transfer procedures.

It is vital that vessel crews are also trained in the specific transfer procedures before any transfers are undertaken.

G+ GPG T:

- 3.2 Training and skills
- 3.2.1 Standard qualifications
- 3.2.2 Site-specific requirements

Emphasis on carrying out site-specific training and drills for transfer vessel crews before start of active transfers on a project.

IMCA HSSE 025:

- 3.6.5 Training and Competence

ACP RP 1001-2-202x Recommended Practice for Offshore Safety Training and Medical Requirements (forthcoming).

6. Communications

Communications are vital during transfers and preparing for transfers. Almost all incidents investigated effectively will include the finding of a lack of or ineffective communication that could have provided safe conditions or stopped unsafe actions from proceeding. This points to the importance of a well-structured, planned, and implemented communications protocol with the right communications equipment for all involved in a transfer.

IMCA HSSE 025:

- 3.6.7 Communications

IMCA D 046, IMCA M 205: Guidance on operational communications

- Communications between any vessels making transfers and onshore marine coordination should be part of preparing for a transfer to monitor weather, to give clearance to approach, and to properly track movements within the site.
- Hand signals should be agreed upon and the Emergency Stop hand signal should be reviewed in toolbox talks and pre-job briefs.
- A seamless method for communication, e.g., via Bluetooth headset, the master and the deckhand should be considered.
- The first person up, and the last person off an unmanned asset should always have a radio with a comms check once transferred, and a backup means of communication (satellite phone, cell phone if network available, etc.).
- Communications should be disambiguated to express intent.
- Previous incidents have been caused by misheard words, such as 'Stop' being mixed up with 'Step.' Words that are in common use are 'Over' to indicate stepping over to a vessel or structure, or 'Hold' to indicate danger and a need to stop.
- Three-way / repeat back communication should be used.

7. Transfer from Crew Transfer Vessel (CTV) to Offshore Structure

Transfers from CTVs to offshore structures was the original method of transfer in offshore wind and is still prevalent today. These transfers have had best practices throughout the years. One of the major historical safety issues that was addressed by the industry was the amount of time necessary to unhook oneself from an SRL when disembarking from a transfer ladder, especially when there was rising weather, necessitating the need to bring technicians off the asset. Wearing gloves trying to unhook a 3-way carabiner meant there was a lot of time spent being hooked onto an SRL with the risk of the boat losing friction on the boat landing and descending, leaving the transferring technician hanging and in some cases being struck by the boat fender on its way up again. The KONG Frog Quick Connector was introduced around 2015, and these incidents happened much less frequently.

G+ GPG T:

- Section 3 Transfer from crew transfer vessel (CTV) to offshore structure
 - “Key Principle: The aim should be to ensure that people do not fall into the sea or become trapped between the vessel and any part of the offshore structure during transfers. This should be achieved through a combination of foundation design, vessel selection, operating procedures, training, and competence. Residual risks should be mitigated by using suitable protective equipment.”
 - Additionally, the aim is to protect people from falling from height to deck, to prevent pulling a person down if a Self-Retracting Lanyard (SRL) pull-down rope is caught between the vessel fender and a boat landing tube, and to prevent the CTV from being pinned under a boat landing tube.
 - PPE checks are important before making a transfer, and it is recommended that the deckhand check for proper PPE before transfer onto an asset. The CTV captain should ask the offshore workers for confirmation of PPE buddy checks prior to transfers off an asset. Additionally, a posted PPE checklist on fixed assets can help with the buddy check before transferring off.
- Section 6 Protection against falling – self-retractable lanyard (SRL) on boat landing ladder

In the American market, ACP recommends the following:

There should be measures in place to prevent a pull-down rope from pulling a climber down if it is stuck between the fender and the boat landing tube. This is typically accomplished with a sacrificial link between the SRL and the pull-down rope, most commonly a trimmed original equipment manufacturer (OEM) approved zip tie.

If the SRL does not pass its pre-use checks, due to previous activation or damage, a risk assessed procedure should be in place to replace the SRL, this should preferably be done by other means of transfer; otherwise, a double-hooking method can be used, which should be risk assessed, and is only recommended when exchanging a faulty SRL or in exceptional circumstances.

“Connector between SRL and harness should enable easy and fast one-handed connection/removal, while wearing gloves. This minimizes [*sic*] the time during which a person is connected to the SRL, while still on the vessel.” (G+ GPG T)

There is equipment developed specifically for offshore wind to address the hazard of remaining connected to an SRL while on a vessel that can move up and down.

There are two aspects regarding the certification of fall protection equipment commonly in use for offshore transfers:

1. The KONG Frog Quick Connector is a commonly used connector that can be used with a gloved hand. It is certified according to EN 362 and EN 12275. For this specific application, ACP recognizes the European Norm until the connector can be ANSI certified due to the increased level of safety it provides during offshore transfers.
2. ANSI recently revised the ANSI/ASSP Z359.14-2021: Self-Retracting Devices standard and revised the maximum locking distance from 54 inches to 42 inches. Part of the strategy for using an SRL from a CTV to a boat landing ladder is to allow for some give and to not lock immediately if the boat moves a little, but also provide fall protection. SRLs that are currently used widely in the Offshore Wind Industry have a max. locking distance of 54 inches, but otherwise conform to ANSI Z359.14-2021 and conform to EN 360. At a minimum, the SRL should comply with OSHA 29 CFR 1910.140 and 1926.502. For this specific application, ACP recognizes the European Norm 360 free fall distance of 54 in, however recommend that SRLs otherwise conform with ANSI Z359.14-2021.

G+ GPG T:

- Section 7 Personal protective equipment (PPE) and system requirements for transfer
 - Table 1 Hazards during transfers by stepping over to boat landing ladder 13
 - Emphasis is placed on the following from Table 1: “Deckhand to remain within area protected by guardrails, or wear a harness and be in work restraint, so that they cannot fall overboard. For this to be effective, the anchor point on the vessel may need to be higher than the attachment point on the deckhand’s harness – this should be checked when selecting a vessel.
If effective work restraint is not possible, then a fall arrest lanyard should be attached to a suitably rated anchor point; the risk assessment should also consider the potential position of the deckhand if suspended, to ensure they will not be suspended in front of the vessel fender, which would introduce a risk of crushing. The position of the anchor point should not impede the deckhand from moving back from the bow, such as if an object falls from the person transferring. Use of a combined harness/PFD may be beneficial”
 - 7.1.1 Protection against drowning: personal flotation device (PFD) (275 Newton SOLAS approved, not U.S. Coast Guard approved as of publication of this guidance)
 - 7.1.2 Protection against drowning: casualty location
 - 7.2 Other PPE for transfer
- Section 8 Use of immersion suits during standard CTV transfers
 - 8.1 Risk of water entry
 - 8.1.1 Likelihood of water entry
 - 8.1.2 Risk of fatality due to water entry
 - 8.2 Recommendations on immersion suit use
 - 8.3 Compatibility and suitability of immersion suits, PFDs, and harnesses

IMCA HSSE 025:

- 3.3 Personal Protective Equipment
- 3.4 Medevac
- 3.5 Luggage
 - Emphasis placed on: “Luggage or equipment should be transferred separately. An exception to this may be when using a W2W gangway/bridge system with an equipment transfer solution designed for simultaneous personnel and equipment transfers.”
- 4.3 Transfers by Crew Transfer Vessels, Small Boats and Daughtercraft
 - 4.3.1 Crew Transfer Vessels
 - 4.3.2 Embarkation/Disembarkation
 - 4.3.2.1 Boat Landing Frames or Surfers

- 4.3.3 Passenger Accommodation and Safety Equipment
- 4.3.4 Small Boat Transfers
 - Note: The use of sliding access methods to boat landings on Offshore WTGs is not recommended due to the inability to use fall arrest equipment while transferring.
- 4.3.4.1 Equipment
- 4.3.5 Davit and Cradle Boat Launching and Recovery Systems
- Appendix 2 Boat Landing Frames or Surfer Landing
 - Note: The use of sliding access methods to boat landings on Offshore WTGs is not recommended due to the inability to use fall arrest equipment while transferring.
- A4-5 Cargo, Luggage and Equipment Transfer Considerations
- A4-6 Stationary Alongside (Equal Deck Heights)

Finally, ACP recommends prior to initiation of transfers at a project site, the interface between the vessel fender, the boat landing and the fall arrest system should be verified. For a boat landing a stepover distance between the fender and the ladder rungs should be between 19.5” – 25.5” (500 mm – 650 mm), unless otherwise engineered. ([IMCA 232 – Standardized Boat Landing Research Report](#))

To prevent porpoising of the CTV, the design of boat landing tubes should be angled in and flush with the transition piece structure, or markings should be set out with reference to high and low points, relative to the highest and lowest astronomical tides, to prevent the bow of the CTV from becoming trapped under the tubes during low tide or over the tubes during high tide. Marine Coordination should be monitoring the tides and communicating with vessel masters when there are particularly low or high astronomical tides.

8. Transfers Between Vessels

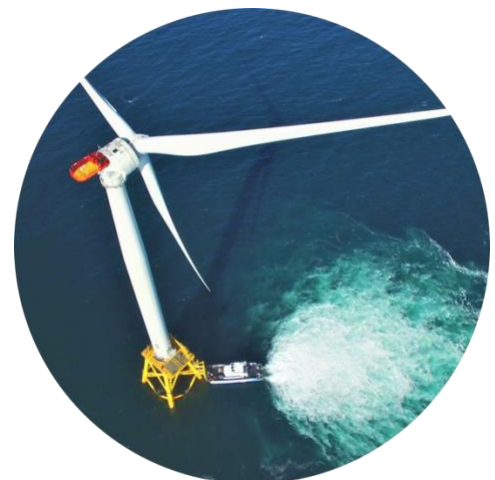
Some large vessels have purpose-designed boat landings which CTVs can push against, allowing personnel to step over to the ladder and climb up to the deck, in a similar manner to accessing an offshore structure and where fitted, this is a preferred means of vessel to vessel transfer offshore.

If using a dynamic positioning (DP) vessel, care should be taken by the CTV operator not to push the DP vessel out of position. The push-on force from the crew vessel could interfere with the DP system.

For a transfer between a crew transfer vessel and a jack up vessel/liftboat, the preferred method is a level step over. This can be done by lowering the jack up vessel to the level of the crew transfer vessel transfer area. The area should be free of obstacles.

Hazards during vessel-to-vessel transfers, such as, transfer beam-on and transfer at stern while underway should be carried out by exception such as in emergencies or for compassionate circumstances and require a full comprehensive risk assessment. The comprehensive risk assessment should carefully identify all potential hazards during specific activities with sufficient barriers in place to mitigate such hazards.

Communications and preparing between vessel masters is vital before and during this type of transfer, and protocols should be agreed regarding how to request vessel maneuvering and the protocol for stopping a transfer.



G+ GPG T:

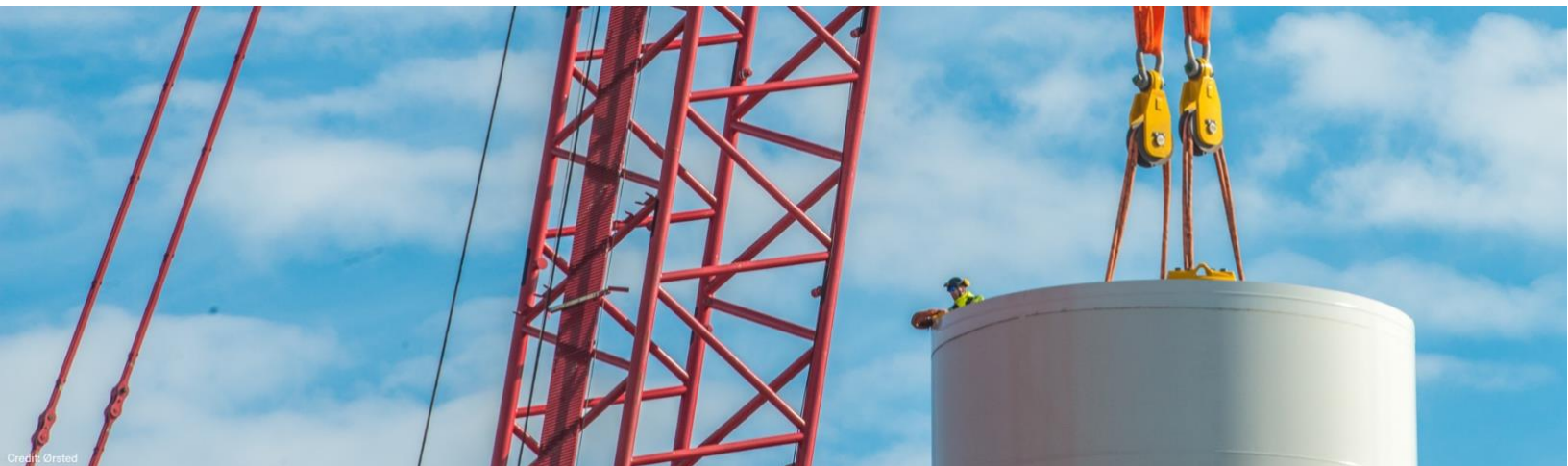
- Section 4 Transfers between vessels
 - 4.1 Level step-over
 - 4.2 Transfer by stepping over onto a boat landing ladder
 - Table 2 Hazards during vessel-to-vessel transfers
- Section 7 PPE And System Requirements for Transfer
 - 7.1.1 Protection against drowning: personal flotation device (PFD)
 - 7.1.2 Protection against drowning: casualty location
 - 7.2 Other PPE for transfer

IMCA HSSE 025:

- 3.3 Personal Protective Equipment
- 3.4 Medevac
- 3.5 Luggage
- 4.4 Vessel to Vessel Transfers
 - 4.4.1 Transfer whilst underway
 - 4.4.2 Stationary Alongside
 - 4.4.3 Transfer whilst on DP
 - 4.4.4 Swing Ropes and Steadying Lines
- 4.5 Pilot Ladder Transfers

ACP recommends pilot ladders should only be used for pilots when boarding or leaving a vessel requiring pilotage. These ladders should be rigged and comply with International and National regulations. They should be maintained in clean and good condition and inspected prior to a pilot transfer.

- A2-3 CTV to Larger Vessel Transfer
- A4-5 Cargo, Luggage and Equipment Transfer Considerations
- A4-6 Stationary Alongside (Equal Deck Heights)



9.A4-4 Personnel Transfer Guidelines and Transfers using Walk to Work (W2W) Gangways

G+ GPG T:

- Section 5 Transfers using walk to work (W2W) gangways
 - 5.1 Gangway operation
 - 5.2 Hazards during specific activities
 - 5.3 Emergency management
 - 5.3.1 Loss of power supply to the gangway
 - 5.3.2 Gangway failure
 - 5.3.3 Operator incapacitated

IMCA HSSE 025:

- 4.2.3 Static, Fixed or Passive Heave Compensated Gangway
- 4.2.4 Motion Compensated W2W Gangways
- 4.2.5 Requirements for Vessels Deploying Bridges or Gangways

IMCA M 103: Guidelines for the design and operation of dynamically positioned vessels

IMCA M 254: Guidelines for Walk to Work Operations

DNVGL-ST-0358: Offshore gangways

10. Crane Operated Personnel Transfer Carrier and Use of Man Riding Baskets

While not the preferred method of transfer, transfer of personnel via transfer baskets may be considered if it can be demonstrated to be the safest and only transfer option available. A specific risk assessment and control measures should be developed for any personnel transfer carriers or personnel riding baskets. This should be risk assessed following the as low as reasonably practical (ALARP) principle. Additionally, transfer baskets should provide occupants with both vertical and lateral impact protection and should be both self-buoyant and self-righting.

IMCA HSSE 025:

- 4.1 Crane Operated Personnel Transfer Carrier
 - 4.1.1 Equipment

In addition, a test lift with an empty carrier with a test weight should be made prior to any person riding.

See also Guidelines for lifting operations (IMCA LR 006, HSSE 019)

- Emphasis on buoyancy of this equipment for floating and self-righting in case of water entry.

11. Boarding at Quayside

Gangways are the primary means of boarding at quayside.

As detailed in IMCA HSSE 025: “Offshore, gangways and accommodation ladders should be designed to enable safe operation and constructed of appropriate material, of the correct dimensions and fitted with non-slip walkways and handrails. Equipment should be regularly inspected and maintained; including a visual check to ensure it is clean and free of slip/trip/fall hazards. Appropriate certification of the gangway or accommodation ladder should take account of the relevant operating requirements for which it is fitted.”

“Where there is the possibility of personnel falling from a gangway or accommodation ladder, a correctly rigged and fit for purpose (i.e., not solely attached to the gangway or accommodation ladder) safety net should be used.”

IMCA HSSE 025:

- 4.2 Gangway, Bridge and Accommodation Ladder Transfer
- 4.2.1 Accommodation Ladders and Gangways
- 4.2.2 Bridges

12. Cradle Launch and Recovery and Davit Systems

Use of Cradle launch and recovery and davit systems from vessels should be restricted to vessel crew members, unless needed to be used by offshore wind workers during emergency.

IMCA HSSE 025:

- A3-1 Cradle System
- A3-2 Davit System

13. Other Methods

The following methods are **not** recommended for Offshore Wind applications:

IMCA HSSE 025:

- A4-1 Platform to Platform Transfer – Crew/Supply Vessel to Seismic Survey Vessel
- A4-2 Crew Supply Vessel Selection
- A4-3 Planning/Design Phase

14. Glossary and References

G+ GPG T:

- B.1 Glossary of acronyms and abbreviations
- B.2 References

IMCA HSSE 025:

- 2 Glossary of Terms
- 5 Further Information

Abbreviations	Words
ACP	American Clean Power
ALARP	As Low as Reasonably Practicable
ANSI/ASSP	American National Standards Institute/American Society of Safety Professionals
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
CTV	Crew Transfer Vessel
DNVGL	Det Norske Veritas Germanischer Lloyd
DP	Dynamic Positioning
EN	European Norms and Standards
G+	G+ Offshore Wind Health and Safety Organization
GPG	Good Practice Guidelines
GPG T	Good Practice Guidelines Wind Farm Transfer
GWO	Global Wind Organization
HSSE	Health, Safety, Security and Environment
IMCA	International Marine Contractors Association
mm	millimeters
OEM	Original Equipment Manufacturer
OSHA	Occupational Safety and Health Administration
PFD	Personal Flotation Device
PPE	Personal Protective Equipment
PTW	Permit to Work
RP	Recommended Practice
SMS	Safety Management System
SRL	Self-Retracting Lanyard
TBT	Toolbox Talk (Pre-job Brief)
US	United States of America
W2W	Walk to work gangways
WTG	Wind Turbine Generator