



HAND SAFETY FIRST® · FIELD APPLICATION GUIDE

Hand Exposure in Marine & Offshore Operations

*Engineering the Hand Out of Deck Handling,
Lifting, Cargo & Maintenance Tasks*

Foreword

A deliberate and limited scope

Marine and offshore operations involve many serious hazards. This guide addresses only one specific category of them.

SCOPE OF THIS GUIDE

"We focus on tasks where an engineered interface can meaningfully change the position of the worker's hand."

Vessels, offshore installations and shipyards involve rotating machinery, electrical systems, stored-pressure hazards, confined spaces, atmospheric risk, work at height and rope and wire under stored energy. This guide does not address any of those hazard categories.

What this guide does address is a specific and recurring pattern: the moment when a worker's hand becomes the primary interface between a person and a load, component, tool or struck surface — because no engineered alternative has been provided. That moment happens on deck, in engine rooms, in workshops and at quaysides. It happens in good weather and bad, on supply vessels and drydocks, and it is largely preventable.

WHAT THIS GUIDE COVERS — AND DOES NOT COVER

This Guide Covers	This Guide Does Not Cover
Suspended-load guiding and tagline control	Rigging theory, crane operation or lifting standards
Supply vessel cargo transfer — the handling moment	Vessel station-keeping, crane SWL or banksman procedures
Heavy component maintenance in engine rooms	Rotating machinery safety or LOTO procedures
Workshop struck-tool and pin work	Electrical, chemical or hot-work hazards
Pipe spool, shaft and tubular handling	Pipeline installation, welding or NDT procedures
Steel plate and structure handling in shipyards	Structural engineering or fabrication design
Gas cylinder deck handling	Pressurised-system management or cylinder inspection

THE HONEST BOUNDARY

Where the PSC/HSF product range does not have a credible intervention, this guide says so explicitly. The final applications section — Part VI — names those boundaries directly. A hazard appearing in this guide does not imply that a PSC/HSF product addresses it.

What Makes Marine Handling Different

Context factors that shape every intervention decision

The tasks described in this guide — lifting, guiding, aligning, striking — exist in most industrial sectors. What makes marine and offshore handling distinct is the set of conditions in which those tasks occur. An intervention that works reliably in a land-based workshop may behave differently when the deck is moving, the surface is wet and the reference points are not fixed.

THE SIX CONTEXT FACTORS

VESSEL MOTION

Even in relatively calm conditions, deck movement changes the effective weight and trajectory of a suspended load. The load that was stationary a moment before is now in motion relative to the landing point. The hand that reaches in to guide it is exposed to energy the operator did not initiate.

CONSTRAINED ACCESS

Engine rooms, pump rooms, cargo holds and chain lockers are designed around equipment, not around maintenance access. The positions workers adopt to complete tasks in these spaces often place hands closer to load paths and pinch points than the same task would require in an open workshop.

WET AND OILY SURFACES

Seawater, hydraulic fluid, lubricants and condensation can reduce available friction on handling surfaces — machined components, deck plating, tool handles and the load itself. Grip that would be reliable on a dry component may not hold. This affects product selection as much as task design.

CHANGING REFERENCE POINTS

On a vessel, the horizon moves, the deck tilts and the load target shifts. The spatial judgements that guide a hand during final positioning — distance, angle, gap — are all being made against a reference that is itself in motion.

WIND AND WEATHER

Wind load on a suspended cargo basket or component adds lateral force that a tagline or guiding tool must manage. Weather also affects worker posture, clothing, glove selection and the time pressure under which tasks are completed.

FATIGUE AND WATCH PATTERNS

Offshore rotation schedules, watch systems and the physical demands of marine work can affect judgement, posture and task execution. These factors do not change what the hand is being asked to do — they change the conditions under which that task is performed.

These context factors do not change what the hand is doing — they change the conditions under which the same hand functions become more hazardous. The application chapters that follow reference these factors where relevant, without repeating them in every section.

Find the Hand™ at Sea

The eight HSF hand functions — applied to marine and offshore contexts

Before selecting a product, tool or control measure, this guide asks a prior question: what is the hand actually doing in this task, and why does it need to be there? The HSF taxonomy identifies eight distinct hand functions. Each points to a different category of engineered intervention.

THE METHOD — FIND THE HAND™

"What is the hand doing? Why is it there? What energy or movement can injure it? Can that function be preserved while moving the hand away?"

THE EIGHT HSF HAND FUNCTIONS — MARINE CONTEXT



PUSH

Applying force away — directing a suspended basket or component toward its landing point or target position



PULL

Drawing a load or component toward a target — recovering a tagline or drawing a pipe spool into alignment



HOLD

Keeping a component stationary during an operation — includes holding a chisel, punch or drift pin during a hammer strike



GUIDE

Directing a moving load along a path — controlling a suspended basket during crane transit or final descent



RETRIEVE

Recovering a sling, hook, tool or line after engagement — often at the point of closest load proximity



ALIGN

Bringing two surfaces or features into precise register — pipe spool bolt holes, machinery feet, shaft couplings



LIFT

Raising and supporting a component — includes grip applications where component geometry denies a natural handhold



STABILISE

Preventing unwanted movement during an operation — particularly critical where vessel motion adds unpredictable load trajectory

HOW TO USE THIS METHOD

For any task, identify which of these eight functions the hand is performing. Then ask: is there a tool that can perform this function with the hand at a safe distance? If yes, that tool is the starting point for the application review. If no — or if the tool geometry does not suit the specific task — the guide says so.

How to Use This Guide

Six application parts and a boundary chapter — organised by hand function, not by vessel type

This guide is organised by hand-exposure application family, not by vessel type or department. Each part covers a recurring category of task where the hand is exposed and where an engineered interface may reduce that exposure. Each chapter follows the same structure: the task and its process flow; where the hand enters the hazard zone and why; and the PSC/HSF products that may address that exposure.

Not a product catalogue. This guide maps applications to product families. Specific model selection, dimensional confirmation and suitability assessment are separate steps. Application review and site confirmation are required before any PSC/HSF product is trialled or adopted.

KEY TO PRODUCT ENTRIES

Symbol	Meaning
PRIMARY	Product directly addresses the identified hand function in this application
CONDITIONAL	Product may apply — surface, geometry or access conditions must be confirmed before selection
REVIEW	Application review required; not a standard selection

WHERE A PRODUCT IS CONDITIONAL

A conditional (○) entry in any table or matrix means: the tool may address this application, but the condition stated must be resolved before selection. Conditional entries require a site-level review of geometry, surface condition, access and component weight. Do not treat a conditional entry as a recommendation without completing that review.

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The Last 300 mm Rule™

at Sea

"If precision requires the hand to enter the hazard, the engineering is incomplete."

The Last 300 mm Rule™ identifies the final approach and positioning phase as a particularly critical hand-exposure zone, because the demand for precision can draw the worker closer to the load. When the load is closest to its target, spatial judgement is stretched and the instinct to use the hand as the final precision instrument is strongest.

At sea, this phase is more demanding than on land. The deck may be moving. The load target may be shifting. Wet surfaces can reduce available friction. Wind adds lateral force. In these conditions, the hand that reaches in to guide, hold or align a load encounters energy that the operator did not create and cannot fully predict.

THE RULE IN PRACTICE

Stop the task before the hand enters the last 300 mm. Ask: is there a tool that can perform this function from a safe distance? If yes, use it. If no — review the task design before proceeding.

PART I OF VI

Suspended Loads & Deck Lifting

Deck crane and derrick operations, supply vessel cargo transfer, and the critical final phase of any marine lift — load approach, final landing and remote engagement.

Chapters 1–3 · Pages 9–17

Deck Crane & Derrick Lifts

The task sequence, the exposure zones and what the hand is doing

THE TASK

Deck crane and derrick lifts on vessels and offshore installations involve picking a load from one position and placing it at another. The mechanical phases of the lift — hook approach, pick, traverse, lower — are controlled from the crane cab or pendant. The hand-exposure occurs at the points where a worker is physically close to the load: during transit control and at landing.

PROCESS FLOW — WHERE THE EXPOSURE OCCURS



EXPOSURE ZONES

EXPOSURE ZONE A

Load in Swing — Tagline Function

During transit, where vessel motion or wind adds lateral force, the load swings relative to the crane position. A worker holding a bare tagline rope is connected directly to the swinging load mass. Rope-to-hand friction, sudden load movement and line snap are the injury mechanisms.

EXPOSURE ZONE B

Final Landing — Hand as Guide

As the load descends toward its landing point, the instinct to use the hand to steer and slow it is strong. The load is heavy, moving, and closing toward a fixed structure. The hand between them is exposed to crush energy that develops faster than the worker can withdraw.

WHAT THE HAND IS DOING — AND WHY

HSF Function	Why the Hand Is There	Injury Mechanism
GUIDE	Directing the load laterally during descent toward the landing point	Crush between load and landing surface; load swing
STABILISE	Preventing load rotation or oscillation during transit via tagline	Rope friction, sudden jerk, line snap under tension
RETRIEVE	Recovering sling or hook after load has landed and been released	Hook swing, residual load movement, sling recoil

The guiding and stabilising functions are legitimate task requirements. The question is whether they must be performed by the bare hand in direct contact with the load or its rigging — or whether a tool can perform the same function with the hand at a safe distance.

Product Mapping — Tagline & Load Control

Matching the tool to the hand function

TAGLINE FAMILY — REMOTE LOAD ORIENTATION & ROTATION INFLUENCE

PRIMARY · ANTI-TANGLE TAGLINE

PSC LoadGuider® Anti-Tangle Tagline

A purpose-designed tagline that allows the operator to exert remote influence over load orientation and rotation from a stand-off position during appropriate phases of the lift. The anti-tangle design reduces the risk of rope fouling during transit. Applied in accordance with the lift plan and operating procedure.

PRIMARY Remote load orientation influence during crane transit where the lift plan permits tagline use.

PRIMARY · ENGINEERED TAGLINE

PSC SafeGuider® Tagline

An engineered tagline providing controlled remote influence over suspended load movement during suitable lift phases. Designed to maintain operator stand-off while allowing directional input to load orientation. Applied where the lift plan authorises tagline attachment and use.

PRIMARY Stand-off load orientation and directional influence during transit where lift plan permits.

PUSH/PULL & GUIDANCE FAMILY — APPROACH & LANDING PHASES

PRIMARY · RIGID-BODY TAGLINE TOOL

HSF RiggerSafe®

A rigid-body tagline tool that allows the worker to apply directional control to a suspended load from a safe stand-off distance. The worker holds the tool handle, not the load or the rigging. Suited to loads where the tool can engage the rigging or load body directly.

PRIMARY Transit control and load stabilising during deck crane and derrick operations.

PRIMARY · PUSH/PULL GUIDANCE

PSC LoadGuider®

A push/pull load control tool for GUIDE and directional correction during the descent and landing phases. Distinct from the PSC LoadGuider® Anti-Tangle Tagline — this is a rigid push/pull interface tool for close-approach guidance, not a tagline for transit-phase orientation.

PRIMARY Load guidance during approach and descent phases.

PRIMARY · FINE STEERING

PSC Guide-It®

Fine directional steering during final approach. Suited to lateral correction and angular misalignment at close range without entering the pinch zone between load and landing.

PRIMARY Final approach steering, correction of lateral drift during landing.

COMPLEMENTARY ROLES — NOT COMPETING PRODUCTS

Tagline (PSC LoadGuider® Anti-Tangle Tagline / PSC SafeGuider® Tagline): Remote influence over load orientation and rotation from an appropriate stand-off position during suitable transit phases, where the lift plan permits. The operator does not contact the load.

Push/pull tool (PSC LoadGuider® / PSC Guide-It®): Controlled remote contact for guidance and positioning during appropriate approach and landing phases — when the load is close to its target and directional correction is required.

Retrieval interface (HSF RiggerSafe® / HSF LoadGrab®): Recovery of accessible lines, rigging or stable loads after landing where the lift procedure permits.

Neither taglines nor push/pull tools are intended to arrest an uncontrolled swinging load or oppose significant load momentum. Tool selection and use must be consistent with the lift plan and site operating procedure.

APPLICATION NOTES

Condition

Guidance

Implementation Guidance

Transitioning from bare-rope to tool-assisted tagline control

CURRENT PRACTICE — BARE ROPE

Worker holds tagline rope directly. Load swing transmits force through rope to hands and body. Worker shortens grip instinctively as load approaches landing, reducing stand-off at a particularly critical phase. On rolling deck, worker may be off-balance when load swing occurs.

IMPROVED PRACTICE — ENGINEERED TAGLINE & TOOL-ASSISTED

Transit phase: PSC LoadGuider® Anti-Tangle Tagline or PSC SafeGuider® Tagline maintains operator stand-off while permitting remote orientation influence. Approach phase: worker transitions to LoadGuider® or Guide-It® for controlled directional correction. No direct rope-to-hand contact at the exposure points.

IMPLEMENTATION STEPS

- Confirm the lift plan permits tagline attachment and specify which tagline product is appropriate for the lift
- Rig PSC LoadGuider® Anti-Tangle Tagline or PSC SafeGuider® Tagline at deck level before the crane hook is engaged — not while the load is in the air
- Confirm both tagline operators have tools before crane picks the load; confirm approach-phase tools (LoadGuider® / Guide-It®) are available at the landing position
- Maintain stand-off throughout transit — do not shorten hold distance as the load descends
- Transition to push/pull guidance tool as the load enters the approach phase; do not use the tagline to arrest or oppose load momentum
- After load lands and slings are slack, retrieve rigging using RiggerSafe® or LoadGrab® until hook is fully stationary and secured

MARINE-SPECIFIC CONSIDERATIONS

VESSEL MOTION DURING LIFT

When the vessel is moving in a seaway, the load's trajectory relative to the landing point changes continuously. Tool-assisted tagline control allows the operator to compensate for this movement without closing the distance to the load.

WET DECK CONDITIONS

Bare rope can become more difficult to control reliably when wet. Tool handle surfaces are designed to maintain grip in wet conditions. Confirm handle suitability for the operating environment before deployment.

TRIAL STARTING POINT

Begin with a controlled lift in benign conditions — calm weather, familiar cargo, experienced crew. Confirm tool engagement, handle geometry and operator stance before using in more demanding conditions. A controlled application trial is the appropriate next step before broader deployment.

Supply Vessel Cargo Transfer

What changes when the deck is moving — and the load target is too

THE TASK

Supply vessel cargo operations involve transferring baskets, skids, tubulars and equipment between a supply vessel and an offshore installation or platform, using the installation crane. The supply vessel is moving in the sea state. The installation is moving differently, or not at all. The basket or cargo load swings between two reference points that are not stationary relative to each other.

PROCESS FLOW



WHY THIS TRANSFER IS DIFFERENT

VESSEL-SIDE EXPOSURE

Load Departure from Moving Deck

When the crane lifts the basket from the vessel deck, the vessel may be at the trough or crest of a wave. The timing of the lift determines the initial swing trajectory. Workers on the vessel deck in proximity to the departing load are in a particularly concentrated hand-exposure zone during this phase.

INSTALLATION-SIDE EXPOSURE

Landing Approach — Two Reference Frames

The basket arriving at the installation deck is swinging relative to a landing point that is also moving, even if slightly. Workers who attempt to guide the basket by hand are bridging two moving reference frames simultaneously — a period of concentrated hand exposure in the transfer cycle.

WHAT THE HAND IS DOING

HSF Function	Marine-Specific Factor	Injury Mechanism
STABILISE — tagline control	Load swinging between two independently moving reference points	Load surge, rope jerk, sudden change in basket trajectory
GUIDE — landing approach	Landing surface not fixed relative to basket at moment of approach	Crush between basket base and deck fitting or structure
RETRIEVE — sling release	Residual basket motion continues after set-down in active sea state	Sling recoil, basket shift, hook swing during sling recovery

Product Mapping & Application Guidance

Tools for tagline control and final landing in dynamic sea conditions

PRIMARY · TRANSIT-PHASE TAGLINE — ORIENTATION INFLUENCE

PSC LoadGuider® Anti-Tangle Tagline / PSC SafeGuider® Tagline

Where the lift plan permits tagline attachment during supply vessel cargo transfer, the PSC LoadGuider® Anti-Tangle Tagline or PSC SafeGuider® Tagline allows the operator to exert remote influence over basket orientation during transit, from a stand-off position. Applied in accordance with the operating procedure for the transfer.

PRIMARY Remote basket orientation influence during transit — where lift plan authorises tagline use.

PRIMARY · STAND-OFF CONTROL TOOL

HSF RiggerSafe®

Rigid-body tagline tool for both vessel-side departure and installation-side landing. Maintains the operator's stand-off distance from the basket during the period of significant load movement. Complements the engineered taglines during phases where direct engagement geometry suits the tool.

PRIMARY Vessel-side departure control and installation-side transit stabilisation.

PRIMARY · LANDING GUIDANCE

HSF LoadGrab®

Where the basket or cargo skid has a defined engagement geometry — a rail, frame tube or structural member — LoadGrab® provides a remote engagement point for directional guidance during the final landing approach. The operator steers the basket laterally without hand contact with the basket itself.

PRIMARY Final landing approach where engagement geometry is confirmed. **CONDITIONAL** Basket geometry must be confirmed.

LoadGrab® is conditional on basket geometry. It is effective where the basket or cargo has a tubular or structural frame member that the tool can engage. Open-frame cargo nets, irregular loose cargo or bags do not present a compatible engagement point. Confirm basket geometry before selecting LoadGrab® for this application.

POSITION ASSIGNMENT — TOOL BY PHASE AND POSITION

Phase / Position	Primary Tool	Function	Note
Transit — orientation influence	LoadGuider® Anti-Tangle Tagline / SafeGuider® Tagline	Remote basket orientation during transit where lift plan permits	Stand-off maintained; not for opposing load momentum
Vessel deck — departure	RiggerSafe®	Basket STABILISE at departure	Worker on vessel deck; basket may surge as it becomes airborne
Installation deck — landing approach	LoadGrab® / PSC LoadGuider®	Final GUIDE at landing point	LoadGrab® where engagement geometry suits; LoadGuider® push/pull tool for correction

WHAT THIS CHAPTER DOES NOT COVER

Supply vessel cargo operations involve simultaneous crane control, vessel movement, sea-state assessment and radio communication between vessel master, crane operator and deck crew. This chapter addresses the hand-exposure moments within that operation only. Crane SWL, banksman procedures, vessel position management and weather operational limits are outside the scope of this guide.

The Last 300 mm at Sea

Why distance matters more when the reference point is moving

The Last 300 mm Rule™ identifies the final approach and positioning phase as a particularly critical hand-exposure zone, because the demand for precision can draw the worker closer to the load. In supply vessel cargo transfer, this phase is compressed and unpredictable in ways that land-based lifts are not. The basket is descending. The deck it is descending toward may be rising to meet it. The closing rate is the combination of two independent motions, not one controlled descent rate.

THE LAST 300 MM — MARINE CARGO APPLICATION

"When two reference points are both in motion, the final 300 mm closes faster than the operator expects. The tool must already be in use before the basket enters that zone."

TIMING THE TOOL ENGAGEMENT

In supply vessel cargo transfer, the critical discipline is engaging the tagline tool before the basket enters the final approach phase — not at the moment it is needed. By the time a bare-hand worker reaches for a swinging basket, it is already inside the 300 mm zone.

TOOL ENGAGED TOO LATE

- Basket reaches landing zone before tagline control is applied
- Worker reaches bare-hand to stabilise or correct basket position
- Basket contacts deck structure or equipment during approach
- Hand is between basket and landing point

TOOL ENGAGED IN TIME

- RiggerSafe® / LoadGrab® engaged during basket transit
- Worker maintains stand-off at full tool length throughout approach
- Basket lands without worker entering the load path
- Sling released after basket is stationary and stable

TRIAL STARTING POINT FOR THIS CHAPTER

Identify one supply vessel run with compatible basket geometry. Confirm RiggerSafe® engagement at departure position and LoadGrab® / LoadGuider® availability at landing position. Run one controlled transfer with full tool deployment and debrief the crew before extending to the broader operation.

Load Approach, Final Landing & Remote Engagement

The doctrine chapter for Part I — the final phase shared by every marine lift

Every marine lift, whatever its type, ends the same way: a load moving toward a fixed point, a worker close to it, and a decision about whether the hand needs to be there.

Chapters 1 and 2 address specific lift types. This chapter addresses the phase those lifts share: the final approach, the landing moment, and the recovery of rigging after landing. This is the phase where bare-hand intervention is most instinctive and most avoidable.

WHY THE FINAL APPROACH CONCENTRATES HAND EXPOSURE

THE PRECISION DEMAND

Accuracy Pulls the Hand In

The closer the load gets to its target, the more precision the GUIDE function requires. Coarse correction can be done with a long tagline. Fine correction — placing a basket within 50 mm of its target — creates the instinct to use the hand directly. That instinct is the exposure.

THE INSTINCT RESPONSE

The Hand as the Default Tool

When a load is close to its target and slightly misaligned, the fastest correction the brain offers is the hand. This is not carelessness — it is a normal human response to a precision task. The engineering solution is to provide a tool that is faster and more available than the hand at that moment.

THE THREE SUB-PHASES OF FINAL APPROACH

Sub-Phase	Description	Exposure
Approach	Load descending toward landing point; 2–3 m above target. Direction and lateral position being corrected.	Load swing, rope/sling energy if correction applied by hand
Landing	Load within 300 mm of landing surface. Target gap closing. Final alignment required.	Crush between load base and deck, structure, or fitting — a particularly critical crush-risk moment
Recovery	Load on deck, slings slack or being removed. Hook being raised or repositioned.	Residual load movement, hook swing, sling recoil

DOCTRINE — FINAL APPROACH

"If precision requires the hand to enter the hazard, the engineering is incomplete."

Product Mapping — The Final Phase

Tools matched to the approach, landing and recovery sub-phases

TAGLINE-TO-PUSH/PULL TRANSITION — THE KEY DISCIPLINE

Where engineered taglines (PSC LoadGuider® Anti-Tangle Tagline / PSC SafeGuider® Tagline) have been used for orientation influence during transit, the operator transitions to push/pull guidance tools as the load enters the approach phase. The tagline provides remote orientation influence at distance; the push/pull tool provides controlled directional correction at closer range. These are sequential, complementary roles — not alternatives for the same phase.

APPROACH SUB-PHASE — PUSH/PULL DIRECTIONAL CORRECTION

PRIMARY · APPROACH PHASE

PSC LoadGuider®

Applies PUSH/PULL directional force to the load during descent toward the landing point. Operator controls load trajectory from outside the load path. Note: this is the PSC LoadGuider® push/pull tool — distinct from the PSC LoadGuider® Anti-Tangle Tagline used in the transit phase.

PRIMARY Approach and final descent guidance across most deck crane applications.

PRIMARY · APPROACH PHASE

PSC Guide-It®

Provides fine directional correction during the approach phase — suited where lateral steering is needed rather than push/pull load management. Useful where LoadGuider® geometry does not suit the specific load surface or access angle.

PRIMARY Lateral steering correction during approach and landing.

LANDING SUB-PHASE — REMOTE ENGAGEMENT

PRIMARY · LANDING PHASE

HSF LoadGrab®

Where the load has a defined engagement point — a frame member, lifting eye, structural tube or designated interface — LoadGrab® allows the operator to maintain directional GUIDE control of the load at the moment it is closest to the landing surface. The operator's hand is at the tool handle, not between the load base and the deck.

PRIMARY Landing phase where engagement geometry is confirmed. **CONDITIONAL** Application review required for irregular load geometry.

RECOVERY SUB-PHASE — AFTER THE LOAD HAS LANDED

After the load has landed and the slings have gone slack, the hook and rigging still carry residual movement risk until they are fully stationary and secured. Recovery of slings, removal of shackles and repositioning of the hook should be performed with the hook stationary and the load confirmed stable. Where the hook is still swinging, use LoadGuider® or Guide-It® to manage position before approaching by hand.

There is no PSC/HSF product that addresses the sling removal task directly. That task should be performed with the hook confirmed stationary, the load confirmed stable, and the crane operator informed.

PART I SUMMARY — THE SEQUENCE FOR MARINE LIFTS

For any marine lift where the lift plan permits: deploy the engineered tagline (PSC LoadGuider® Anti-Tangle Tagline or PSC SafeGuider® Tagline) during transit for remote orientation influence. As the load enters the approach phase, transition to the push/pull guidance tool (PSC LoadGuider® / PSC Guide-It®) for controlled directional correction. Use HSF LoadGrab® for remote engagement at the landing phase where basket geometry permits. Do not use the hand to close any gap that a tool can close at a safe distance. Do not use any tool to arrest or oppose significant load momentum — that is an operating and lift-planning matter, not a hand-tool task.

PART II OF VI

Cargo, Stores & Quayside Handling

Truck and quayside loading and unloading, stores and spares with awkward geometry, gas cylinders and ferrous components where specific handling tools genuinely apply.

Chapters 4–6 · Pages 19–24



Truck & Quayside Loading / Unloading

Where port and vessel handling meet — the transfer point

THE TASK

Cargo arrives at the quayside by truck or is assembled on the quay for vessel loading. Transfer from truck to quay, from quay to vessel hold or deck, and in reverse — involves crane or forklift picks with final positioning at the landing point. The hand-exposure pattern in quayside operations closely mirrors that of deck crane lifts, with one difference: the reference points are fixed. There is no vessel motion at the quay. The transfer task is more controlled, but the volumes handled and the pace of port operations can compress the time available for each lift.

PROCESS FLOW



WHERE THE HAND ENTERS THE HAZARD

EXPOSURE · TRANSIT PHASE

Load Swing in Open Quayside Environment

At the quayside, wind and the arc of the crane swing can produce load movement that a bare-rope tagline operator responds to by tightening the grip rather than maintaining stand-off. The exposure mechanism is the same as on deck — load mass plus swing energy transmitted through the rope to the worker's hands.

EXPOSURE · LANDING PHASE

Final Placement at Vessel or Quay Target

When cargo is being placed into a vessel hold, a container stack or a precise quay position, the final alignment often requires correction in the last 300 mm. Workers reach in to GUIDE or ALIGN the load. On a busy quay, this happens under time pressure and sometimes with multiple operations nearby.

PRODUCT MAPPING

CONDITIONAL · TRANSIT-PHASE TAGLINE

PSC LoadGuider® Anti-Tangle Tagline / PSC SafeGuider® Tagline

Where the crane operation at the quayside handles loads requiring orientation control during transit, and the lift plan permits tagline use, the engineered tagline family provides remote orientation influence from a stand-off position. Conditional on the lift plan, cargo type and site operating procedure — not all quayside lifts will require or permit tagline attachment.

CONDITIONAL Lift plan and operating procedure must permit tagline attachment before selection.

PRIMARY · STAND-OFF TRANSIT TOOL

HSF RiggerSafe®

Rigid-body tagline tool for STABILISE/GUIDE during transit from truck or quay stack to vessel or storage position. Direct stand-off engagement with the load or its rigging.

PRIMARY Transit control where RiggerSafe® engagement geometry suits the load.

PRIMARY · APPROACH GUIDANCE

PSC LoadGuider®

PUSH/PULL guidance during descent and landing. Corrects trajectory in the final approach phase without hand contact with the load. This is the push/pull tool — distinct from the PSC LoadGuider® Anti-Tangle Tagline.

PRIMARY Final approach and landing guidance.

PRIMARY · FINE STEERING

PSC Guide-It®

Lateral correction at close range during final placement. Suited to loads requiring precise target alignment at the landing point.

PRIMARY Final landing precision steering.

Quayside cargo operations often involve a mix of different cargo types and geometries within a single vessel loading sequence. Tagline suitability depends on the lift plan and operating procedure for each operation — confirm before selection. Push/pull tool selection should be confirmed for each cargo type rather than applied generically.

Stores, Spares & Awkward Cargo

When geometry denies a natural handhold — the LIFT function as the exposure

THE TASK

Vessels and offshore installations receive a continuous flow of spares, consumables, replacement parts and equipment that does not arrive in consistently shaped packages. Heavy machined components, replacement pump bodies, motor housings, valve assemblies, gearbox covers and similar items may have no convenient grip surface. They are heavy enough to injure, awkward enough to grip insecurely, and often need to be moved short distances without a crane available for the whole journey.

THE EXPOSURE PATTERN

The risk in stores and spares handling is not usually a swinging load or a crane pick. It is the moment when a worker lifts or places a heavy component with an insecure grip — because the component's geometry does not offer a natural handhold — and the component shifts, slips or is set down onto a finger or hand.

WHEN LIFT ASSIST APPLIES

PRIMARY · AWKWARD COMPONENTS

PSC Lift Assist

Engineered LIFT interface for components that lack a natural handhold. Provides a secure, geometry-matched hold point on smooth, machined or irregularly shaped components. The LIFT function — where geometry denies a reliable hand interface — is the primary application here.

PRIMARY

Heavy components with no convenient grip surface.

COMPLEMENTARY · SPECIFIC PROFILES

PSC Ezy-Lift

Alternative LIFT interface where PSC Lift Assist geometry does not suit the component profile. Application review required to confirm compatibility with the specific component being handled.

CONDITIONAL

Component profile review required.

WHEN LOADGRAB® MAY APPLY

LOADGRAB® — CONDITIONAL IN THIS CHAPTER

LoadGrab® is not a general awkward-cargo handling tool. It applies where the component has a specific engagement point — a structural tube, frame member or defined lifting feature — that the tool can capture reliably. Where that geometry exists, LoadGrab® extends the operator's reach and improves control. Where it does not, LoadGrab® is not the answer.

Before selecting LoadGrab® for a stores or spares handling task, confirm: (a) the component has a tubular or structural feature the tool can engage; (b) the engagement is secure before the component is moved; (c) the component weight is within the tool's design parameters.

WHAT THIS CHAPTER DOES NOT ADDRESS

General handling of light consumables, bags or small components does not require a PSC/HSF tool. This chapter applies specifically to components heavy enough or awkward enough that the LIFT function — maintaining secure grip — is the exposure mechanism. If the component can be safely handled by hand for the task in question, a tool is not the answer.

Cylinders & Ferrous Components

Specific tools for specific geometries — with declared conditions

GAS CYLINDER DECK HANDLING

Gas cylinders on vessels and offshore installations are moved between storage, distribution points and work areas. A cylinder's smooth, cylindrical body offers no natural grip surface. When the deck is wet or the vessel is moving, securing a cylinder during transit becomes harder. The conventional response — gripping the cylinder neck or leaning it against the body — creates exposure if the cylinder shifts or falls.

PRIMARY · CYLINDER HANDLING

PSC GasGrab®

Provides a geometry-matched LIFT and HOLD interface for the cylinder body, replacing the bare-hand grip on a smooth cylindrical surface. Used to lift, move and restrain cylinders during transit. Particularly relevant on wet decks or in conditions where cylinder stability is reduced by vessel motion.

PRIMARY Gas cylinder deck movement, positioning and transit.

Application review required for specific cylinder dimensions and weights before selection.

FERROUS PLATE & PANEL HANDLING — DECLARED CONDITIONS

Steel plates, hatches, access panels and equipment covers on vessels are often ferrous and may be suited to magnetic handling tools — but this is conditional on surface condition, which is more variable at sea than in a land-based workshop.

CONDITIONAL · FERROUS SURFACES

PSC Load-It® / PSC MagHead

Magnetic LIFT/HOLD interface for ferrous flat and curved surfaces. Applicable where the surface is confirmed ferrous, dry enough for magnetic adhesion, free from heavy scale or paint, and within the tool's design parameters for the component weight.

CONDITIONAL Surface suitability assessment required.

Marine Surface Caution: Vessel decks, hatch covers and exposed structural panels may carry surface corrosion, salt-water film, heavy anti-corrosion coatings or irregular profiles that can reduce magnetic adhesion. Magnetic handling tools must be assessed against the actual surface condition, not an assumed ideal.

PART III OF VI

Marine Maintenance & Machinery Handling

Pumps, motors and compressors; gearboxes, shafts and heavy components; pipe spools, valves and component alignment — where the confined engineroom creates its own hand-exposure conditions.

Chapters 7–9 · Pages 26–34



Pumps, Motors & Compressors

Confined engineroom, no natural handhold, oily machined surfaces

THE TASK

Vessel engine rooms and machinery spaces require regular maintenance of pumps, motors, compressors and associated equipment. Removal of pump casings, motor housings, impellers and compressor components involves lifting and manoeuvring heavy machined parts in spaces that were designed around the equipment, not around maintenance access. Headroom is frequently limited. Access is often from one side only. The components are smooth, oily and machined to close tolerances — denying the hand both a natural grip and a reliable friction surface.

PROCESS FLOW — PUMP/MOTOR REMOVAL



THE ENGINEROOM COMPOUND EXPOSURE

EXPOSURE 1 · GEOMETRY

No Natural Handhold on Machined Components

Pump casings, motor housings and compressor bodies are precision-machined to circular cross-sections. They have no grip features. The bare hand on a smooth cylindrical surface — especially when wet or oily — provides unreliable LIFT and HOLD grip for a heavy machined component.

EXPOSURE 2 · ACCESS

Constrained Space Posture

In confined machinery spaces, workers adopt postures that reduce their effective load capacity and increase the likelihood of the component shifting unexpectedly. A component that would be safely managed in a workshop becomes a significant exposure risk in a space where the worker cannot stand straight, place both feet properly, or see all sides simultaneously.

LOTO/isolation procedures, permit-to-work and confirmation that rotating machinery is de-energised are prerequisites for the handling tasks described in this chapter. This guide addresses the physical handling moment only — after isolation is confirmed.

Product Mapping — Lift Interface in Confined Spaces

Primary tools and the conditional magnetic note

PRIMARY TOOLS — LIFT ASSIST FOR COMPONENTS WITHOUT GRIP GEOMETRY

PRIMARY · ENGINEEROOM HANDLING

PSC Lift Assist

Engineered LIFT interface for components lacking a natural handhold. Provides a secure, geometry-matched hold point on smooth machined surfaces in confined engineroom conditions. The primary tool for pump casings, motor bodies and compressor housings where the component geometry denies a reliable hand grip.

PRIMARY Smooth, machined cylindrical or irregular components in confined spaces.

COMPLEMENTARY · ALTERNATIVE PROFILES

PSC Ezy-Lift

Where PSC Lift Assist geometry does not match the specific component profile — different cross-section, unusual mounting geometry or specific access angle — PSC Ezy-Lift provides an alternative LIFT interface. Application review required for each component type.

CONDITIONAL Profile-specific application review required.

MAGNETIC TOOLS — CONDITIONAL; REQUIRE SURFACE ASSESSMENT

Oily and wet machined surfaces are a reason for caution, not a primary application for magnetic handling tools.

Pump casings, motor bodies and compressor housings in service carry hydraulic fluid, lubricating oil, seawater ingress and surface films that can reduce magnetic adhesion. Magnetic handling tools may apply to specific ferrous components in this environment — but only after surface condition assessment, component weight confirmation and geometry suitability review.

When magnetic tools may apply in this chapter: A ferrous access cover, inspection hatch or panel that is dry, free from heavy coating and within the tool's weight parameters may be a genuine magnetic handling application in the engineroom environment. Confirm each instance. Do not assume general machinery handling is within scope for PSC Load-It® or PSC MagHead.

ACCESS AND EXTRACTION TECHNIQUE

Component Stage	Recommended Approach	Reason
Breaking free from mount	Pry bars or purpose extractors; not bare-hand force	Component may shift suddenly when fasteners are released
Initial lift-off	PSC Lift Assist engaged before load is lifted	First lift-off from mount is the moment of substantial positional uncertainty for the component
Transit to extraction point	Maintain Lift Assist grip throughout transit	Component geometry does not improve during transit; grip security must be confirmed before moving
Set-down in workshop	Confirm receiving surface is clear before approach	Setting a heavy component down on a clear flat surface is the most controlled moment of the task — use it

Gearboxes, Shafts & Heavy Components

Where weight, geometry and confined access combine

THE TASK

Marine gearbox removal, shaft withdrawal and heavy component extraction combine high component mass with irregular geometry, confined access and the need for precise positioning both on removal and on reinstallation. A gearbox does not have convenient grip surfaces. A shaft requires careful axial management during withdrawal. Both require the hand to be close to the component for a significant portion of the task.

WHERE THE HAND ENTERS THE HAZARD

EXTRACTION PHASE

Component Shift at Break-Free

As a gearbox or heavy assembly breaks free from its mount, it moves suddenly in the direction of least resistance. If a hand is steadying the component at that moment, it may be caught between the moving component and adjacent structure.

TRANSIT PHASE

LIFT on Irregular Components

Carrying or crane-manoeuving a heavy gearbox body in a confined space requires the worker to maintain the LIFT function on a component that does not offer a natural or symmetric hand position. Grip security is the exposure mechanism throughout transit.

REINSTALLATION PHASE

ALIGN — Hand as the Alignment Tool

Lowering a heavy component back onto its mounting bolts or dowel pins requires final precision alignment. The instinct is to use the hand to guide the component onto its register. This is a particularly critical hand-exposure moment in the reinstallation task.

PRODUCT MAPPING

PRIMARY · ALIGN & GUIDE

PSC Guide-It® / PSC LoadGuider®

For the final alignment phase: Guide-It® and LoadGuider® direct the component toward its mounting position from outside the pinch zone. The ALIGN function is performed by the tool, not by the hand at close range.

PRIMARY Final alignment approach during component reinstallation.

PRIMARY · LIFT INTERFACE

PSC Lift Assist

For the transit phase, Lift Assist provides a secure LIFT interface where the component geometry does not provide a natural handhold.

PRIMARY Heavy component transit without natural grip geometry.

PRIMARY · TUBULAR AND SHAFT HANDLING

PSC Handle-Tech Pipe Lifter

For shaft removal and reinstallation where the component is tubular or cylindrical: Handle-Tech Pipe Lifter provides an engineered LIFT interface matched to the tubular geometry. Suited to shaft sections, hydraulic cylinder bodies and tubular components in machinery spaces.

PRIMARY Shaft and cylindrical component extraction and reinstallation.

Pipe Spools, Valves & Component Alignment

Handling, approach and guidance before bolting — not installation procedure

THE TASK AND ITS SCOPE

Marine pipework maintenance involves removing and reinstalling pipe spools, valves and associated components. This chapter addresses the physical handling of those components — their movement, approach to position and guidance into alignment — before the bolting stage. The scope is the hand-exposure moment: the component in motion, approaching its mating flange or valve body, and the ALIGN task that precedes mechanical connection.

WHERE THE HAND ENTERS THE HAZARD

APPROACH PHASE

Pipe Spool Moving Toward Mating Flange

A pipe spool being moved back into position after maintenance must approach the mating flange accurately. The worker steadying the spool during approach places the hand between the spool end and the flange face — where crush energy is available the moment the spool contacts the flange.

ALIGNMENT PHASE

Bolt Hole Registration

Aligning bolt holes on a heavy pipe spool or valve body requires the spool to be shifted in very small increments while it is suspended or supported. The hand used to GUIDE the spool for this angular correction is at the interface between the component and adjacent structure.

PRODUCT MAPPING

PRIMARY · TUBULAR GUIDE

PSC Tubular Guider

Directional guidance of pipe spools during approach. The Tubular Guider allows the worker to GUIDE and PUSH/PULL the component from a stand-off position, steering it toward the mating flange without placing the hand between the spool end and the flange face.

PRIMARY Pipe spool approach and angular guidance during alignment.

PRIMARY · LIFT AND TRANSIT

PSC Handle-Tech Pipe Lifter

Engineered LIFT interface matched to pipe spool geometry for the transit phase — from maintenance position to reinstallation point. Suited to pipe sections and valve bodies where the component diameter and weight suit the tool's design parameters.

PRIMARY Pipe spool and valve body transit and positioning.

PRIMARY · FINAL ALIGN CORRECTION

PSC Guide-It®

Fine ALIGN function during the bolt-hole alignment phase. Where the spool needs small lateral or angular adjustment to bring bolt holes into register, Guide-It® applies that correction without the hand entering the pinch zone.

PRIMARY Bolt-hole alignment correction — final approach before make-up.

The scope of this chapter ends when the bolt holes are aligned and the bolts are being inserted. Flange make-up, gasket seating, bolting sequence and torquing are outside the scope of this guide.

PART IV OF VI

Workshop, Strike, Pipe & Tubular Handling

Struck tools and drift pins; pipe sections, shafts and tubular components; gas cylinders and cylindrical vessel handling on deck — three distinct hand functions, one part.

Chapters 10–12 · Pages 35–41

Struck Tools, Drift Pins & Alignment Work

The HOLD function in the strike zone — a direct and preventable exposure mechanism

THE TASK

Marine and offshore maintenance workshops, engine rooms and fabrication areas involve regular use of chisels, punches, drift pins and alignment tools that require one hand to hold the tool and one hand (or another person's hand) to swing the hammer. The struck-tool scenario is a direct and readily identifiable hand-exposure mechanism in industrial maintenance work — and one of the few where a remote holding tool directly removes the HOLD function from the strike zone.

THE EXPOSURE — STRAIGHTFORWARD AND PREVENTABLE

PRIMARY EXPOSURE

The Holding Hand in the Strike Zone

The hand holding the chisel, punch or drift pin is in the same zone as the hammer's strike path. A missed strike, a deflected hammer, a tool that moves unexpectedly — each produces the same result. The mechanism is direct and the severity is significant.

MARINE-SPECIFIC FACTOR

Workshop Space and Posture

Marine workshops are frequently small. Workers may be striking in awkward postures — kneeling, crouching, reaching — that reduce the accuracy and control of the hammer swing. In confined engine rooms, striking tasks may be performed in even more constrained positions.

PRODUCT MAPPING — REMOTE HOLD TOOLS

PRIMARY · HOLD FUNCTION — STRIKE PROTECTION

PSC FingerSaver®

Holds chisels, punches and drift pins remotely, placing the worker's hand outside the hammer's strike arc. The HOLD function is performed by the tool; the hand holds the tool handle, not the blade.

PRIMARY All chisel, punch and drift pin work in workshops and field maintenance.

PRIMARY · ALTERNATIVE HOLD TOOL

StrikeSafe®

Alternative struck-tool HOLD interface for applications where FingerSaver® geometry does not suit the specific tool profile being held. Application review required for specific chisel or punch cross-section.

PRIMARY Struck-tool work where FingerSaver® profile does not suit.

PRIMARY · CHISEL & PUNCH GEOMETRY

PSC Chisel & Punch Holder

Geometry-specific holder for chisels and punches during strike. Designed for ALIGN and remote HOLD of the tool at the strike point during the hammer strike.

PRIMARY Chisel and punch operations in workshop and field maintenance.

DOCTRINE — STRUCK TOOL WORK

"The hand that holds the chisel should hold a tool that holds the chisel."

Pipe Sections, Shafts & Tubular Components

GUIDE, LIFT and ALIGN — where tubular geometry creates the exposure

THE TASK

Pipe sections, propeller shafts, hydraulic cylinder bodies, roller bodies and similar tubular components appear throughout marine and offshore maintenance operations. Their cylindrical geometry is the source of the exposure: they roll, they offer no natural grip at the end face, and they require controlled guidance when being threaded through bulkheads, into bearing housings, or aligned to a mating component.

KEY MARINE APPLICATIONS

Application	HSF Function	Exposure Mechanism	Tool
Pipe section approach and positioning	GUIDE / PUSH	End-face contact between pipe and fitting/flange during approach; hand between pipe end and target	PSC Tubular Guider — directional guidance during approach
Shaft threading through bulkhead/bearing	LIFT / GUIDE	Shaft moving axially; hand at entry or exit end during threading — crush between shaft end and structure	Handle-Tech Pipe Lifter — lift and support; Tubular Guider — directional control
Hydraulic cylinder body handling	LIFT	Smooth machined surface, no grip geometry, significant weight; grip instability during transit	Handle-Tech Pipe Lifter primary; Lift Assist where diameter suits
Tubular in confined access	GUIDE / ALIGN	Restricted manoeuvring space limits stand-off; hand proximity to adjacent structure during positioning	Tubular Guider — directional guidance at close range

ON HOSES — CONDITIONAL AND LIMITED

HOSE HANDLING — CONDITIONAL AND LIMITED

Heavy industrial hoses with rigid end fittings may present a compatible application for PSC tubular tools where the end fitting geometry suits the tool and the hose weight and stiffness create a genuine handling exposure. This is not a generalised hose-handling application. Where the hose is flexible enough to be managed by hand without significant weight or control exposure, a tool is not indicated. Application review required for each specific hose type and dimension.

PRIMARY · TUBULAR GUIDE

PSC Tubular Guider

Directional control of pipe sections, shaft ends and tubular components during approach and threading. Maintains operator stand-off from the component end during the alignment phase.

PRIMARY Pipe, shaft and tubular approach and alignment.

PRIMARY · LIFT & TRANSIT

PSC Handle-Tech Pipe Lifter

Engineered LIFT interface matched to tubular geometry. Provides a secure hold point for the transit phase — moving the component from storage or workshop position to the installation point.

PRIMARY Pipe section, shaft and cylindrical component transit.

Gas Cylinders & Cylindrical Vessel Handling

Deck movement, no grip surface, marine-specific instability

THE TASK

Gas cylinders on vessels and offshore installations are moved regularly — between storage, distribution and use points. A cylinder's smooth cylindrical body provides no natural handhold. In a stable land environment, this is manageable with technique. On a vessel where the deck is pitching or rolling, or on an offshore platform in rough conditions, a cylinder that is partially secured or being moved by bare-hand grip on a smooth body is a fall-and-crush risk.

THE MARINE-SPECIFIC FACTORS

DECK MOTION

A cylinder being moved across a rolling deck requires the worker to manage both the cylinder's weight and the changing angle of the deck simultaneously. A bare-hand grip on a smooth cylinder surface does not provide the control authority to manage both.

WET DECK SURFACES

Seawater on deck can reduce friction between the cylinder base and the deck when upright, and between the worker's gloves and the cylinder body when being moved. The cylinder that appeared stable may move unexpectedly when the deck shifts under it.

STORAGE CONSTRAINTS

Cylinders in marine storage are often in racks or against bulkheads in confined spaces. Removing a cylinder from a rack in a confined space while the vessel is moving compounds the geometry and stability exposures simultaneously.

PRODUCT MAPPING

PRIMARY · CYLINDER LIFT & HOLD

PSC GasGrab®

Geometry-matched LIFT and HOLD interface for the cylinder body. Replaces the bare-hand grip on the smooth cylindrical surface. The worker maintains control through the GasGrab® handle, not through friction contact between hand and cylinder body. Particularly effective in the marine environment where cylinder instability is a compound rather than a single factor.

PRIMARY

Gas cylinder deck movement, transit and positioning.

Where a cylinder has a compatible diameter and geometry, PSC Tubular Guider may provide supplementary directional control during cylinder positioning at a manifold or connection point. PSC GasGrab® is the primary tool for the LIFT/HOLD function. Application review required for the specific cylinder dimensions.

WHAT THIS CHAPTER DOES NOT COVER

Gas cylinder inspection, valve condition assessment, manifold connection procedures, cylinder pressure management and storage rack engineering are outside the scope of this chapter. The handling tool addresses the physical movement of the cylinder — not the pressurised system it contains.

PART V OF VI

Shipyard & Drydock Handling

Steel plates, fabricated structures and panel handling; machinery removal, reinstallation and component positioning during drydock — where our products fit the handling phase, not the full operation.

Chapters 13–14 · Pages 42–46



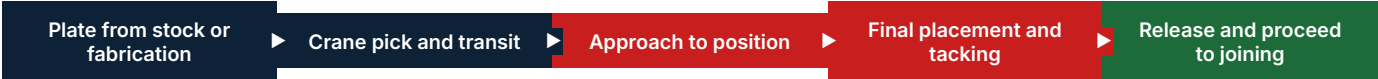
Steel Plates, Fabricated Structures & Panel Handling

Ferrous surfaces, conditional magnetic handling and crane-assisted positioning

THE TASK

Shipyard and drydock work involves handling steel plates, fabricated structural sections, access panels and equipment covers. These components are typically ferrous, flat or curved, heavy and smooth on the working face. They arrive at the work position by crane and require guidance and final positioning by workers on deck or staging. The hand-exposure moment is the final approach and positioning phase — when the plate is close to its target weld, fit-up or installation position.

PROCESS FLOW



PRODUCT MAPPING — DECLARED CONDITIONS

CONDITIONAL · FERROUS FLAT SURFACES PSC Load-It® Magnetic LIFT/HOLD interface for confirmed ferrous flat surfaces. Where the plate surface is dry, clean, free from heavy scale or thick coating, and within the tool's weight parameters, PSC Load-It® provides a handling interface that replaces bare-hand grip on a smooth plate face. CONDITIONAL Surface confirmation required: ferrous, dry, accessible, within weight parameters.	PRIMARY · CRANE-ASSISTED POSITIONING HSF RiggerSafe® / PSC LoadGuider® For crane-assisted plate positioning — where the plate is suspended from the crane and being manoeuvred into the fit-up position — RiggerSafe® and LoadGuider® provide STABILISE and GUIDE/PUSH/PULL functions from outside the pinch zone between the plate and adjacent structure. PRIMARY Crane-assisted plate approach and positioning.
CONDITIONAL · CURVED FERROUS SURFACES PSC MagHead Where the component is ferrous but curved, profiled or irregularly shaped, MagHead provides a magnetic interface suited to geometries where Load-It® flat-face contact is not achievable. Same surface condition requirements apply. CONDITIONAL Geometry and surface assessment required.	LOADGRAB® IN THIS CHAPTER LoadGrab® applies where the steel component has a defined engagement point — a structural frame member, lifting lug or tube section the tool can capture reliably. It does not apply to flat plate surfaces as a general positioning tool. Confirm engagement geometry before selection.

Surface Conditions & Implementation Notes

Why shipyard surfaces require more careful assessment than workshop conditions

SHIPYARD SURFACE CONDITIONS — MORE VARIABLE THAN WORKSHOP

Steel plate and fabricated structures in a shipyard arrive from different sources and in different surface states. New plate from the steel stockist may be clean, mill-scaled and dry — a relatively predictable magnetic handling surface. Plates removed from an existing vessel structure may carry years of paint, anti-corrosion coating, marine growth removal residue, weld-adjacent heat scale and surface contamination. The gap between ideal and actual conditions is wider in shipyard work than in a land-based fabrication workshop.

SURFACE ASSESSMENT BEFORE TOOL SELECTION

Surface Condition	Magnetic Tool Suitability	Alternative
New mill-scale steel, dry surface	Typically compatible — confirm weight parameters	—
Primed or painted steel — thin coat	May be compatible — assess adhesion before lift	Test pull required before use
Heavy anti-corrosion coating (epoxy, etc.)	Likely incompatible — significant adhesion reduction	RiggerSafe® / LoadGuider® for crane-assisted positioning
Wet plate surface	Not suitable — moisture can reduce adhesion unpredictably	Crane slings and LoadGuider® / Guide-It® for approach
Scale, rust, surface contamination	Not suitable without surface preparation	Prepare surface or use sling-based positioning

FABRICATED STRUCTURES — FRAME MEMBERS AND ENGAGEMENT POINTS

Fabricated structural sections — frames, ring sections, transverse members — often present tubular or structural members that are compatible with LoadGrab® or RiggerSafe® engagement. Where the structure has a defined tube or member the tool can engage, push/pull and tagline control during crane-assisted placement becomes straightforward. Where the structure is all-plate with no tubular engagement, crane slings and LoadGuider® guidance during approach are the primary approach.

WHAT FOLLOWS THIS CHAPTER — AND WHAT DOESN'T

This guide's scope in Chapter 13 ends when the plate or structure is in position and tacking has commenced. Structural welding, NDT, coating application and quality inspection are outside the scope of this guide. The positioning tools described here address the hand-exposure moment during approach and placement, not the joining or finishing operations that follow.

Machinery Removal, Reinstallation & Component Positioning

Drydock crane lifts into machinery spaces — the positioning phase only

THE TASK AND ITS SCOPE

Drydock periods allow access to machinery and components that cannot be reached during normal vessel operation. Main engine overhaul, propulsion component removal, auxiliary machinery replacement and structural component reinstallation all involve crane picks into and out of confined machinery spaces. This chapter addresses the physical handling phase — the moment when the component is moving and approaching its installation position. It does not address the engineering decisions about the component itself, the disassembly sequence or the systems work that follows installation.

WHERE THE HAND ENTERS THE HAZARD IN DRYDOCK HANDLING

DRYDOCK PHASE 1

Component Lowering into Machinery Space

A crane lowers a heavy component through a hatch or opening into a machinery space. Workers inside the space GUIDE it toward its installation position. The component is overhead, descending. The hand guiding it is between the component and the adjacent structure.

DRYDOCK PHASE 2

Final ALIGN onto Mounting

As the component reaches its mounting position — machinery feet, dowel pins, bearing housing or bulkhead penetration — the final alignment requires precision. The instinct is to use the hand to register the component onto its mounting. This is a particularly critical hand-exposure moment in the drydock installation task.

DRYDOCK PHASE 3

Component Positioning at Propeller / Rudder

Where propeller or rudder-adjacent components are being repositioned — not the propeller hydrodynamic work itself, but the handling of shaft seals, rope guards or related components — the same approach and alignment exposure applies. Scope is the physical positioning task only.

PRODUCT MAPPING

PRIMARY · APPROACH & ALIGN

PSC LoadGuider® / PSC Guide-It®

For the final alignment approach: LoadGuider® and Guide-It® direct the component onto its mounting from outside the pinch zone. ALIGN and GUIDE functions performed by the tool.

PRIMARY

Final alignment approach — component to mounting.

PRIMARY · TRANSIT & LIFT INTERFACE

PSC Lift Assist / Handle-Tech Pipe Lifter

For transit and positioning of heavy machinery components without natural handhold geometry in confined drydock machinery spaces. Handle-Tech Pipe Lifter for tubular or cylindrical components; Lift Assist for irregular machinery bodies.

PRIMARY

Heavy machinery component transit in confined spaces.

Propeller blade handling, propeller shaft installation and rudder engineering work are specialised marine engineering tasks with their own safety regimes, tooling requirements and Class Society oversight. This guide does not address those operations. The scope here is the handling of adjacent components — rope guards, shaft seals, access covers, bearing housings — during the positioning phase of drydock maintenance.

Scope Notes & Boundaries

Where the drydock handling scope ends

DRYDOCK VS. ENGINEROOM — KEY DIFFERENCES

Factor	Engine room Maintenance	Drydock Handling
Access overhead	Often limited — hatch and deck plate restrictions	Crane access through hatches and open deck areas
Crane availability	Frequently by chain block or manual means in confined space	Drydock crane or shipyard crawler crane typically available
Component size range	Pump-scale to large gearbox components	Main engine components to full machinery modules
Ground condition	Vessel in service — machinery at operating temperature history	Vessel on blocks — all systems isolated and confirmed

IMPLEMENTATION NOTES

In drydock conditions, the availability of a shipyard crane creates the opportunity for better-controlled lifts than are typical during underway maintenance. Use that advantage: plan tool engagement before the component is moving, not during. Confirm LoadGuider® and Guide-It® are available at the receiving position before the crane pick commences.

PART V SUMMARY

Shipyard and drydock handling involves the same hand functions as marine maintenance — LIFT, GUIDE, ALIGN, STABILISE — applied to larger components with better crane access but similarly complex surface conditions. The product selection logic is the same: identify the function, confirm the geometry and surface, and select the tool that performs the function from a safe distance.

This guide's scope in Chapter 14 ends at the mechanical connection stage — when the component is on its mounting and bolts are being inserted. Alignment verification, torquing sequence, systems recommissioning and survey by Class Society are outside the scope of this guide.

PART VI OF VI

Where We Do Not Have the Solution

The boundaries of the PSC/HSF product range in marine and offshore operations — stated clearly, with reasons. Knowing where a tool does not belong is as important as knowing where it does.

Pages 48–50

Where We Do Not Have the Solution

Marine hazard categories outside the PSC/HSF intervention scope

The chapters in this guide address the hand-exposure moments where an engineered interface can meaningfully change the position of the worker's hand. There are many other hand-exposure risks in marine and offshore operations where that is not the case — where the hazard requires engineering controls, systems procedures or operational management that is outside the scope of any hand-tool intervention.

This chapter names those hazards directly. A PSC/HSF product should not be presented as a solution to any of them. If a customer or site contact identifies one of these as a priority concern, the correct response is to acknowledge the hazard and direct them to the appropriate control — not to find a PSC/HSF product that can be connected to it.

DOCTRINE — HONEST BOUNDARIES

"Knowing where a tool does not belong is as important as knowing where it does."

CATEGORY 1 — STORED ENERGY IN LINES AND MACHINERY

✗ Mooring snap-back zones

A mooring line under tension stores energy proportional to its breaking load. When it parts, the snap-back zone is defined by the line geometry, not by the worker's position. No handling tool addresses this. Control is procedural and spatial — keeping workers out of the snap-back zone before tensioning commences.

✗ Winch and capstan nip points

The nip point between a rope or wire and a rotating drum or barrel is a machine guarding and exclusion zone problem. A PSC/HSF tool does not address it. Control requires guarding, exclusion and trained operation.

✗ Anchor and windlass machinery

Anchor chain under load, the hawsepipe throat and windlass barrel represent stored energy exposure at a scale and geometry that no hand-handling tool addresses. Proximity exclusion and operational procedures are the controls.

✗ Rope and wire under stored energy

Taut rope, wire, synthetic line or cable under tension can part or spring without warning. The recoil energy is a function of the line's stored elastic energy. Control is exclusion from the recoil zone.

Where We Do Not Have the Solution

Systems, environmental and specialist marine hazards

CATEGORY 2 — SYSTEMS AND ATMOSPHERIC HAZARDS

✗ Hydraulic and pressurised system stored energy

Pressurised hydraulic systems, steam lines, compressed-air systems and gas-pressurised equipment require isolation and depressurisation before any maintenance access. A hand-handling tool does not manage stored pressure. LOTO, isolation valves and pressure verification are the controls.

✗ Electrical exposure

Electrical isolation, arc flash risk and electrical contact exposure are managed by electrical permit systems, isolation procedures and PPE appropriate to the voltage level. No PSC/HSF product addresses electrical hazards.

✗ Confined space atmospheric hazards

Oxygen deficiency, toxic atmosphere and flammable gas accumulation in cargo holds, ballast tanks, void spaces and enclosed machinery spaces require atmospheric testing, ventilation and permit-to-enter. A handling tool does not address atmospheric risk.

CATEGORY 3 — SPECIALIST MARINE OPERATIONS

✗ Diving and underwater support operations

Diving operations involve specialist equipment, surface supply systems, decompression management and underwater communication. The hand-exposure risks in diving are managed by diving procedures, dive control and equipment integrity. This guide does not address them.

✗ Work at height and rigging

Working aloft — on masts, on staging, on the exterior of a structure — requires fall protection, working-at-height procedures and rigging competency. The hand-handling tools in this guide are deck-level and workshop tools. They are not working-at-height controls.

✗ Rotating propulsion machinery in service

Propeller shafts, stern tubes and thruster systems in operation — or in any state other than fully isolated and confirmed stationary — are outside the scope of any hand-handling tool. Isolation and confirmation of machinery status are prerequisites for any of the maintenance tasks in Part III of this guide.

THE CORRECT RESPONSE AT THE BOUNDARY

When a site contact presents one of these hazard categories as a concern, the correct PSC/HSF response is: "This is outside the scope of our intervention range. The control for this hazard category is [exclusion zone / procedural isolation / machine guarding / atmospheric testing]. We can assist with the handling tasks that occur before or after these operations — but not with the hazard itself."

Application-Selection Matrix — Part A

Push/pull tagline, load control and lift interface families · ● Primary ● Conditional – Not applicable

Chapter / Application	HSF RiggerSafe®	PSC LoadGuider®	PSC Guide-It®	HSF LoadGrab®	PSC Lift Assist / Ezy-Lift
Ch 1 · Deck Crane & Derrick Lifts	●	●	●	–	–
Ch 2 · Supply Vessel Cargo Transfer	●	●	–	●	–
Ch 3 · Load Approach, Final Landing & Remote Engagement	●	●	●	●	–
Ch 4 · Truck & Quayside Loading/Unloading	●	●	●	–	–
Ch 5 · Stores, Spares & Awkward Cargo	–	–	–	●	●
Ch 6 · Cylinders & Ferrous Components	–	–	–	–	–
Ch 7 · Pumps, Motors & Compressors	–	–	–	–	●
Ch 8 · Gearboxes, Shafts & Heavy Components	–	●	●	–	●
Ch 9 · Pipe Spools, Valves & Component Alignment	–	–	●	–	–
Ch 10 · Struck Tools, Drift Pins & Alignment Work	–	–	–	–	–
Ch 11 · Pipe Sections, Shafts & Tubular Components	–	●	–	–	●
Ch 12 · Gas Cylinders & Cylindrical Vessel Handling	–	–	–	–	–
Ch 13 · Steel Plates, Fabricated Structures & Panels	●	●	–	●	–
Ch 14 · Machinery Removal, Reinstallation & Positioning	–	●	●	–	●

Matrix Part A — push/pull tagline, load control and lift interface families. See Matrix Part B for magnetic, struck-tool and tubular handling families. ● Conditional entries require application review before selection. This matrix is a thinking tool; it does not constitute a product specification or suitability confirmation for any specific task.

Application-Selection Matrix — Part B

Tagline, magnetic, struck-tool and tubular families · ● Primary ● Conditional – Not applicable

Chapter / Application	PSC LoadGuider® Anti-Tangle Tagline / PSC SafeGuider® Tagline	PSC GasGrab®	PSC Load- It® / MagHead	PSC FingerSaver® / StrikeSafe® / Chisel & Punch Holder	PSC Tubular Guider / Handle-Tech Pipe Lifter
Ch 1 · Deck Crane & Derrick Lifts	●	–	–	–	–
Ch 2 · Supply Vessel Cargo Transfer	●	–	–	–	–
Ch 3 · Load Approach, Final Landing & Remote Engagement	●	–	–	–	–
Ch 4 · Truck & Quayside Loading/Unloading	●	–	–	–	–
Ch 5 · Stores, Spares & Awkward Cargo	–	–	–	–	–
Ch 6 · Cylinders & Ferrous Components	–	●	●	–	–
Ch 7 · Pumps, Motors & Compressors	–	–	●	–	–
Ch 8 · Gearboxes, Shafts & Heavy Components	–	–	–	–	●
Ch 9 · Pipe Spools, Valves & Component Alignment	–	–	–	–	●
Ch 10 · Struck Tools, Drift Pins & Alignment Work	–	–	–	●	–
Ch 11 · Pipe Sections, Shafts & Tubular Components	–	–	–	–	●
Ch 12 · Gas Cylinders & Cylindrical Vessel Handling	–	●	–	–	●
Ch 13 · Steel Plates, Fabricated Structures & Panels	–	–	●	–	–
Ch 14 · Machinery Removal, Reinstallation & Positioning	–	–	–	–	●

Matrix Part B — Tagline family (Ch 1–2 primary, Ch 3–4 conditional on lift plan), PSC GasGrab®, PSC Load-It® / MagHead, struck-tool holders and tubular handling families. Tagline ● = application requires lift-plan confirmation that tagline attachment is authorised. See Matrix Part A for push/pull tagline, load control and lift interface families. ● Conditional entries require application review and confirmation before product selection.

Controlled Trial Framework

From application review to deployment decision — four steps

A controlled application trial is the appropriate next step after identifying a likely application from this guide. It is a defined, time-limited trial with named tools, named tasks and a clear evaluation criterion.

STEP 1 — APPLICATION REVIEW

CONFIRM THE APPLICATION BEFORE ORDERING

Using the matrix and chapter guidance, identify the specific task or tasks to be trialled. Confirm: the hand function being performed, the component geometry, the access conditions, any surface conditions relevant to magnetic tool selection, and the frequency of the task. If the application is conditional (C), the review must resolve the condition before the trial proceeds.

STEP 2 — DEFINE THE TRIAL

Element	What to Specify
Task	The specific task — one chapter, one operation type. Not "general deck lifting." Specific: "basket landing on production deck during resupply runs."
Tools	Named products and quantities. Two units of RiggerSafe® for a two-tagline task, for example.
Duration	A fixed trial period — one month, or a defined number of operations — with a review date.
Evaluation criterion	What will confirm the tool works: operator feedback, hand proximity observation, task completion without bare-hand intervention at the exposure point.

STEP 3 — CONDUCT THE TRIAL

Run the trial on the specific task with the named tools. Brief the operators before the first use. Observe at least one operation in person if feasible. Collect operator feedback at the end of the trial period — not a questionnaire, a conversation about what worked and what did not.

STEP 4 — EVALUATE AND DECIDE

IF THE TRIAL SUCCEEDS

Define the deployment scope: which vessels, which operations, how many units, what maintenance schedule. Document the trial outcome for internal reference before extending to the broader operation.

If the Trial Does Not Succeed: Identify specifically what did not work — tool geometry, access, operator training, or genuinely wrong application. A result on one task does not invalidate other applications. Reassess with the specific finding.

Product Family Quick Reference

Push/pull tagline & load control — not a product catalogue

TAGLINE & REMOTE LOAD CONTROL FAMILY

Product	Principal HSF Function	Typical Marine & Offshore Application
PSC LoadGuider® Anti-Tangle Tagline	Remote STABILISE and orientation influence — stand-off load control during transit, where lift plan permits	Deck crane and derrick lifts (Ch 1); supply vessel cargo transfer transit phase (Ch 2); quayside crane lifts where lift plan authorises tagline use (Ch 4)
PSC SafeGuider® Tagline	Engineered tagline — controlled remote influence over suspended load orientation during appropriate lift phases	Deck crane and derrick operations (Ch 1); supply vessel cargo transfer where lift plan permits tagline attachment (Ch 2)

Taglines are applied during the transit phase of a lift, where the lift plan authorises their use, to provide remote influence over load orientation and rotation from a stand-off position. They are not intended to arrest an uncontrolled swinging load or oppose significant load momentum. As the load enters the approach phase, the operator transitions to push/pull guidance tools. Tagline use requires lift-plan confirmation in each application.

PUSH/PULL GUIDANCE & REMOTE ENGAGEMENT FAMILY

Product	Principal HSF Function	Typical Marine & Offshore Application
HSF RiggerSafe®	Rigid-body STABILISE and GUIDE — direct stand-off engagement with load or rigging	Deck crane and derrick operations; supply vessel cargo transfer (vessel-side departure and installation-side positions)
PSC LoadGuider®	PUSH/PULL guidance — approach and descent directional control (push/pull tool, not tagline)	Deck crane landing approach; quayside cargo placement; gearbox and machinery reinstallation approach
PSC Guide-It®	Fine GUIDE and ALIGN — lateral correction during final approach and alignment	Final placement correction for suspended loads; pipe spool bolt-hole alignment; component registration onto mounts
HSF LoadGrab®	Remote engagement at defined geometry — basket, frame or structural tube engagement point	Supply vessel basket landing where engagement geometry is confirmed; steel structure approach where tube or frame member is present

LIFT INTERFACE — COMPONENTS WITHOUT NATURAL HANDHOLD GEOMETRY

Product	Principal HSF Function	Typical Marine & Offshore Application
PSC Lift Assist	Engineered LIFT interface for smooth or irregular components without a natural handhold	Pump casings, motor bodies, compressor housings and heavy components in engine rooms, workshops and stores
PSC Ezy-Lift	Alternative LIFT interface for specific component profiles where Lift Assist geometry does not apply	Complementary to PSC Lift Assist where component profile requires a different approach — application review required

All product entries in this quick reference are application family mappings. Specific model selection, dimensional suitability and application review are separate steps before any product is ordered for trial.

Product Family Quick Reference

Tubular & pipe handling · Struck-tool & alignment work

TUBULAR & PIPE HANDLING

Product	Principal HSF Function	Typical Marine & Offshore Application
PSC Tubular Guider	Directional GUIDE of tubular components during approach, threading and alignment	Pipe spool approach and alignment; shaft threading through bulkheads; cylindrical component directional control
PSC Handle-Tech Pipe Lifter	Engineered LIFT interface matched to tubular component geometry	Pipe sections, shaft sections, hydraulic cylinder bodies in engine rooms, machinery spaces and drydock handling tasks

STRUCK-TOOL & ALIGNMENT WORK

Product	Principal HSF Function	Typical Marine & Offshore Application
PSC FingerSaver®	Remote HOLD of chisels and punches — removes holding hand from strike zone	Chisel, punch and drift pin work in vessel workshops, engine rooms and field maintenance positions
StrikeSafe®	Alternative struck-tool HOLD interface for specific chisel and punch geometries	Where PSC FingerSaver® profile does not suit the specific tool — application review required
PSC Chisel & Punch Holder	ALIGN and remote HOLD of chisels and punches during strike	Workshop and field maintenance struck-tool work across marine environments

Product entries are application family mappings only. Dimensional confirmation and application review are required before selection. The HSF functions referenced (HOLD, GUIDE, LIFT, etc.) are the locked HSF eight-function taxonomy applied consistently throughout this guide.

Product Family Quick Reference

Cylinder & magnetic handling · Trademark acknowledgements

CYLINDER HANDLING

Product	Principal HSF Function	Typical Marine & Offshore Application
PSC GasGrab®	Geometry-matched LIFT and HOLD interface for smooth cylindrical gas cylinder bodies	Gas cylinder movement and relocation on vessel decks and offshore installation storage areas

MAGNETIC HANDLING — CONDITIONAL; DECLARED SURFACE CONDITIONS REQUIRED

Product	Principal HSF Function	Typical Marine & Offshore Application
PSC Load-It®	Magnetic LIFT/HOLD interface — ferrous flat surfaces only, surface conditions declared	Steel plate and panel handling in shipyard/drydock where surface is confirmed ferrous, dry and within weight parameters
PSC MagHead	Magnetic LIFT/HOLD interface — ferrous curved and irregular surfaces, declared conditions	As Load-It® where component geometry is curved — same surface condition requirements apply

TRADEMARK ACKNOWLEDGEMENTS

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Publication Note: This is an engineering reference guide. No content in this guide constitutes a product specification, safety rating, lifting claim or compliance certification. Product performance, compatibility and suitability must be assessed for each specific application before selection and trial.

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