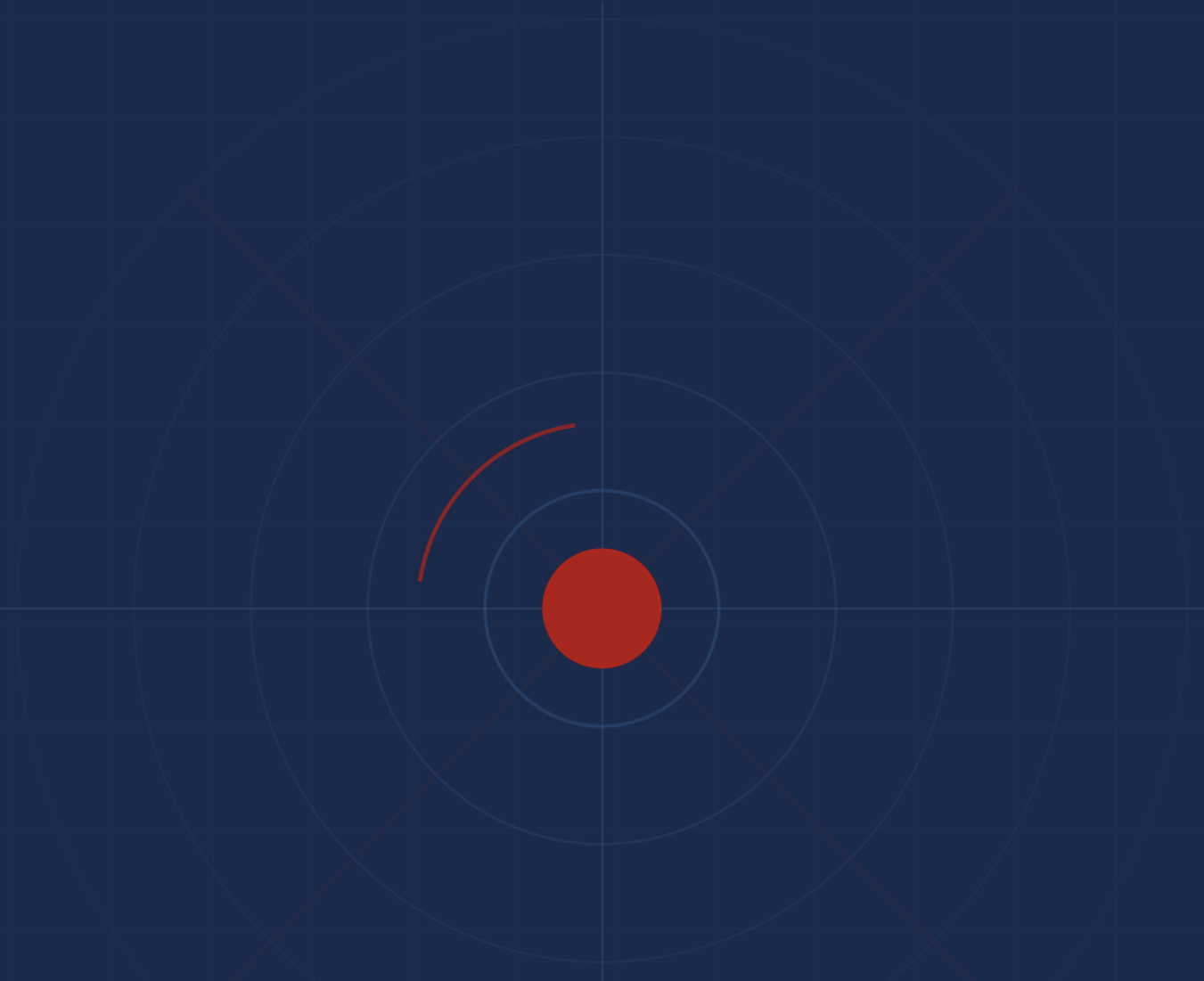




WHY HAND SAFETY IS STILL BEING SOLVED THE WRONG WAY

From Protection to Engineering Control

EXECUTIVE SUMMARY

Hand Safety Has Improved. It Has Not Fundamentally Changed.

Over the past two decades, industry has invested heavily in hand protection. Gloves have become more specialised. Training more rigorous. Incident-reporting more sophisticated. By almost every conventional measure, hand safety has progressed.

And yet hand injuries remain one of the most frequent, most costly, and most preventable categories of workplace harm.

The problem is not effort. It is direction.

The dominant approach is structured around a single premise: that the appropriate response to hand exposure is hand protection. This premise is not wrong. It is incomplete. And its incompleteness is the source of the problem.

Protecting the hand addresses the symptom. It does not address the cause. The cause is that the hand is in the hazard zone at all — and in most industrial task designs, it is required to be there. No amount of protection changes that structural fact.

The Central Argument

- The industry is solving the wrong problem. The question is not how to protect the hand — it is why the hand is there.
- Injuries concentrate at a specific, predictable point in the task cycle: the final stage of positioning and placement.
- At that point, control requirements are highest — and so is exposure. The hand is required precisely where it is most at risk.
- This is not a behavioural failure. It is a design failure.
- The solution is an engineered interface between the hand and the task — one that maintains control while removing direct exposure.
- Until that interface is designed in, risk is not managed. It is absorbed.

What This Paper Does Not Argue

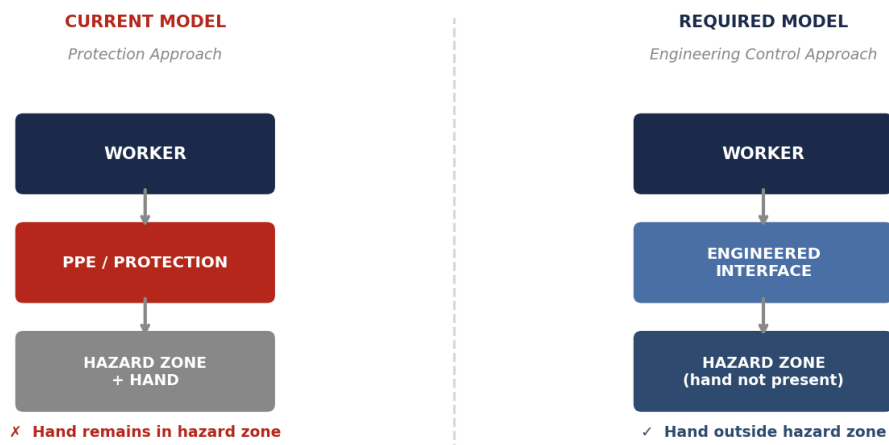
This paper does not argue that PPE, training, or procedures are without value. They are necessary components of any safety system. The argument is that they have been deployed as the primary solution to a problem they were not designed to solve. The gap is not in the quality of these tools. It is in the architecture of the system they sit within.

Structure of This Paper

1. The Problem — Why the current approach starts from the wrong question.

2. The Misdiagnosis — Where injuries actually occur, and why our assumptions are wrong.
3. The Control Problem — The structural trap at the final stage of task execution.
4. What We Actually See on the Shopfloor — Field observation, not theory.
5. The System Gap — What is missing from the current safety model.
6. The Normalisation of Risk — How unsafe practices become standard practice.
7. Redefining the Solution — What a safety tool should actually be defined by.
8. The Engineering Model — The Hand → Interface → Load framework.
9. Task Decomposition — Locating and specifying exposure points.
10. Implementation — From framework to operational practice.
11. The Future of Hand Safety — What structural change looks like.

Protection Model vs. Engineering Control Model



Conceptual model — illustrative

The next advance in hand safety will not come from better gloves or more rigorous training. It will come from redesigning how work is done.

SECTION I

The Problem — Starting from the Wrong Question

SECTION I — THE PROBLEM

Starting from the Wrong Question

Every serious conversation about hand safety eventually reaches the same destination: PPE. The discussion might begin with incident data, task analysis, or risk assessment — but the conclusion is almost invariably the same. Better gloves. More specific gloves. Gloves designed for this particular task, this particular hazard profile.

This is not an irrational response. The industry has invested substantially in improving PPE, and that investment has produced genuinely better products.

But gloves protect a hand that is already in the hazard zone. They do not remove it.

That is the structural flaw. The industry has spent decades optimising the wrong output.

The Question That Is Not Being Asked

The question that dominates hand safety practice is: *how do we protect the hand?*

The question that should dominate it is: *why is the hand there?*

This is not a semantic distinction. It is a structural one. The moment the question changes, the entire architecture of the safety system must change with it. A system built around protecting the hand will optimise for better protection. A system built around removing the hand from hazard zones will optimise for elimination. The first system has a theoretical ceiling. The second does not.

KEY DISTINCTION

Protection manages the consequences of exposure. Elimination removes the exposure. These are not the same outcome — and they do not require the same investment.

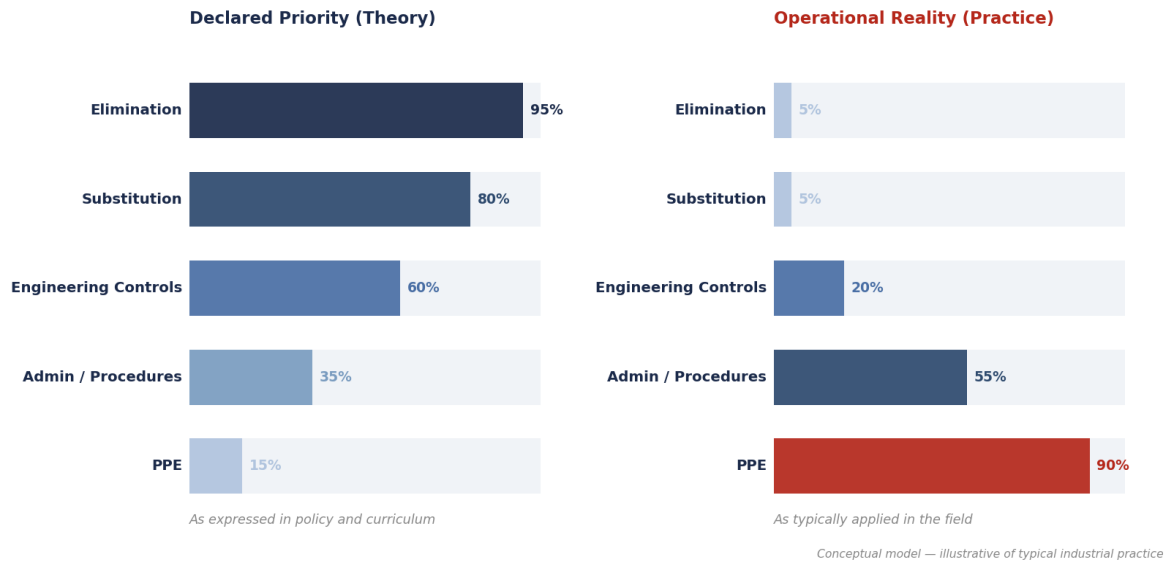
The Hierarchy of Controls: Theory vs. Practice

The Hierarchy of Controls places elimination at the top and PPE at the bottom. It is taught in every safety curriculum, cited in every risk assessment framework, and endorsed by every major regulatory body.

It is almost universally inverted in practice.

In most industrial settings, hand safety begins and ends with PPE. Engineering controls are rarely specified at the task design stage. Elimination is almost never attempted for manual handling tasks. The hierarchy is acknowledged. It is not applied.

Hierarchy of Controls: Declared Priority vs. Operational Reality



Why the Inversion Persists

- PPE is the path of least resistance — no task redesign, no change to established workflows, no capital expenditure beyond the equipment itself.
- Engineering controls require task redesign: investment, time, and a willingness to accept that the current design is inadequate, not merely under-equipped.
- Elimination requires a more fundamental acknowledgement: that the task, as currently designed, cannot be made safe. It can only be redesigned.

That acknowledgement is difficult. It implies that previous design decisions were wrong. And so it tends not to be made — until an injury forces the conversation.

If the hand is required inside the hazard zone, the task is not yet engineered.

SECTION II

The Misdiagnosis — Where Injuries Actually Occur

SECTION II — THE MISDIAGNOSIS

Injuries Do Not Occur Where We Assume They Do

Safety interventions are only as effective as the assumptions that direct them. If the assumption about where injuries occur is wrong, the interventions will be aimed at the wrong point in the task cycle — and the injuries will continue.

In hand safety, the dominant assumption is wrong.

The Conventional Assumption

The prevailing view is that hand injuries occur during the high-energy phases of manual handling — during lifting, during transport of heavy loads, during high-force operations. High energy implies high risk.

Field observations and incident reviews frequently show otherwise.

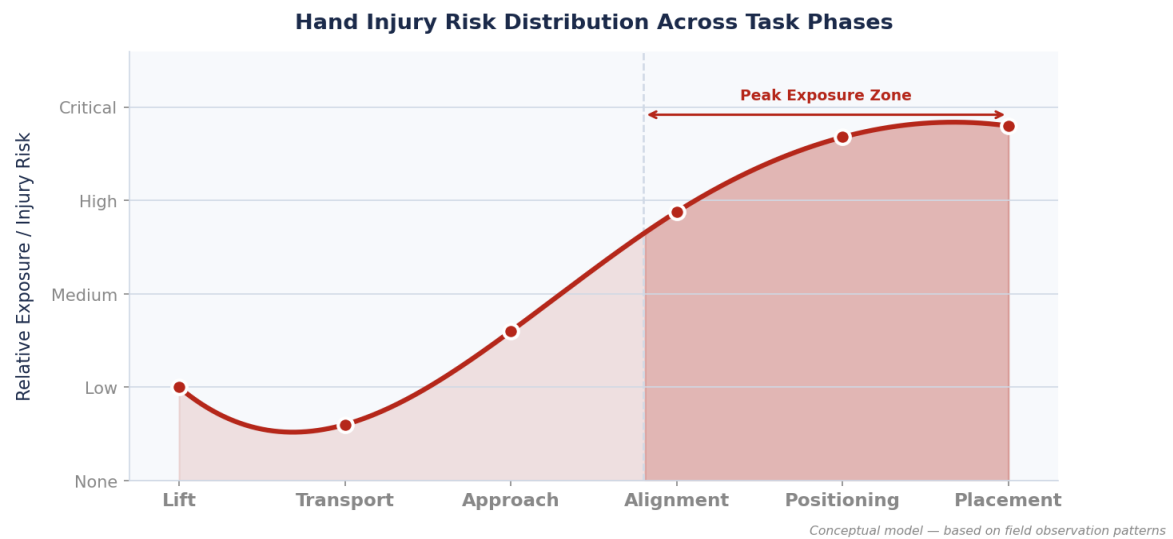
Where Injuries Actually Occur

Hand injuries cluster at the final stages of a task — specifically during:

- **Alignment** — orienting a load to meet a specific position, aperture, or reference point.
- **Positioning** — holding or guiding a load into place, often while another operation is performed simultaneously.
- **Final placement** — settling a load into its target position, where fit, clearance, and precision are at their most demanding.

Usually in the last few inches. When the load is almost in place.

These are not the heaviest phases of a task. They are often the lightest. But they are the most precision-dependent — and precision demands contact.



The Three Converging Factors

What makes the final stage uniquely hazardous is the convergence of three characteristics simultaneously:

Factor	Characteristic	Safety Consequence
High Precision	Tolerances are tight; small errors matter	Hand must be in close, sustained contact with load
High Contact	Load is at or near its target position	Maximum hand-to-hazard proximity at peak task phase
High Unpredictability	Loads shift; surfaces vary; conditions change	Worker cannot anticipate or pre-position against sudden forces

The Implication for Safety Investment

If injuries concentrate at alignment, positioning, and placement — safety interventions directed at earlier phases will not prevent them. A premium cut-resistant glove worn during lifting does not protect the hand during final placement. A training programme focused on manual handling technique does not address the mechanics of the alignment trap.

The interventions are real. They address genuine risks. But they do not address the specific risk where the injuries are actually occurring.

DIAGNOSTIC PRINCIPLE

Before specifying a safety intervention, determine which phase of the task it addresses. If it does not address the phase where exposure is highest, it will not prevent the injuries that are most likely to occur.

SECTION III

The Control Problem — The Structural Trap

SECTION III — THE CONTROL PROBLEM

The Structural Trap: Where Control Is Required, Exposure Is Highest

The persistence of hand injuries at the final stage of tasks is not explained by worker carelessness. It is explained by task design.

The design of most manual handling tasks creates a structural trap: the moment where control requirements are highest is also the moment where exposure is highest. These two peaks are not independent. They are causally connected.

Why Control Is Required at the Final Stage

- The load is at or near its target position. Small deviations have significant consequences.
- The margin for error is minimal. The tolerances that matter most are encountered here, not during transport.
- Adjustments must be made in real time, in response to the actual behaviour of the load.

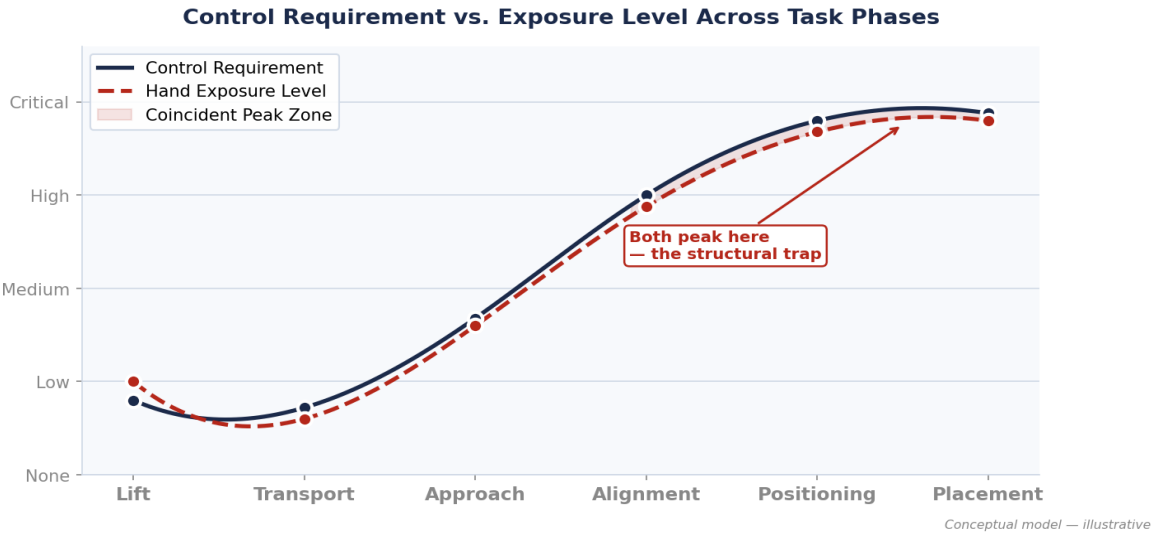
In this environment, control is not a preference. It is a functional requirement. In the current design of most tasks, the hand is the only instrument available to provide it.

“No one plans to put their hand there. The task demands it.”

The Mechanics of the Trap

Task Condition at Final Stage	Why It Demands Hand Contact	Safety Consequence
Load instability	Weight distribution shifts unpredictably near placement	Reactive hand movement into hazard zone
Tight clearances	Object must be guided to within millimetres of target	Sustained close-contact hand positioning
Simultaneous operations	One hand guides; the other holds, fastens, or adjusts	Both hands at risk simultaneously
Speed pressure	Operational tempo discourages tool use at final stage	Shortcuts increase direct exposure

Task Condition at Final Stage	Why It Demands Hand Contact	Safety Consequence
Feedback dependency	Worker needs tactile confirmation of correct position	Contact maintained beyond necessary duration



The highest control requirement coincides with the highest exposure. This is not coincidence. It is a design outcome — one that the industry has accepted as normal.

Why Behavioural Solutions Cannot Resolve a Structural Problem

Training, awareness, and procedural reinforcement operate at the behavioural level. They ask workers to be more careful, more attentive, more disciplined in technique.

These responses are not without merit. But they cannot resolve a structural problem. If the task design requires the hand to be in the hazard zone at the moment of maximum risk, a worker who is trained, careful, and fully attentive is still exposed.

A structural problem requires a structural solution.

SECTION IV

What We Actually See on the Shopfloor

SECTION IV — FIELD OBSERVATION

What We Actually See on the Shopfloor

The following are not hypothetical scenarios. They are observations repeated across industrial environments — manufacturing floors, assembly lines, logistics operations, construction sites. They require no theory to understand. They require only recognition.

WHAT WE ACTUALLY SEE ON THE SHOPFLOOR

Field observation — not theory.

- Workers guiding loads by hand during final placement — fingers under the edge for alignment.
- One hand stabilising a component while the other adjusts position. Both inside the hazard zone.
- Loads held against a hard stop while a fastener is driven, with the guiding hand still in place.
- Improvised reach tools — a piece of timber, a scrap of rod — used when the gap is too tight for a full hand, but no designed interface is available.
- A worker leaning in at the last stage of a lift because the jig requires visual confirmation of seating.
- A sheet, panel, or component held in place while alignment is checked — by feel, not by a fixed guide.
- The tool is there. The hand still goes in.

None of these behaviours are careless. All of them are rational responses to tasks that were designed — by default, not by intention — to require the hand at the point of maximum risk.

“This is the moment where someone ‘just reaches in.’ It is also the moment the system failed — before the shift started.”

The Pattern Is Consistent

Across sectors and task types, the pattern is the same. The injury does not occur during the heavy phase. It occurs in the last few inches of travel. At the moment of precision. When the worker is concentrating most. When the load is almost in place.

That is when it happens. Not during the lift. Not during the carry.

Understanding this pattern is the beginning of addressing it. The task must be redesigned at precisely this point — not reinforced with additional PPE or additional reminders.

FIELD OBSERVATION

In every environment where this pattern has been examined, the finding is the same: the hand is present at the final stage because the task requires it to be. Removing that requirement is an engineering problem, not a training problem.

SECTION V

The System Gap — What Is Missing

SECTION V — THE SYSTEM GAP

What the Current Safety System Is Missing

The standard industrial hand safety system consists of three components: PPE, procedures, and training. These components are not ineffective. They are incomplete.

Between the worker's hand and the task, there is a layer missing — one that the current system does not define, does not require, and does not deploy.

What the Three Layers Do

- **PPE** manages the consequences of contact. It reduces the severity of injury when the hand is struck, cut, or crushed. It does not prevent the contact from occurring.
- **Procedures** specify safe behaviours for conducting a task. They describe what to do. They do not change the design of the task itself.
- **Training** equips workers to operate within the system as designed. It improves performance. It does not change the structure of what workers are asked to perform.

All three layers operate within a given task design. None of them questions it.

The Missing Layer

The missing layer is an engineered interface between the hand and the task.

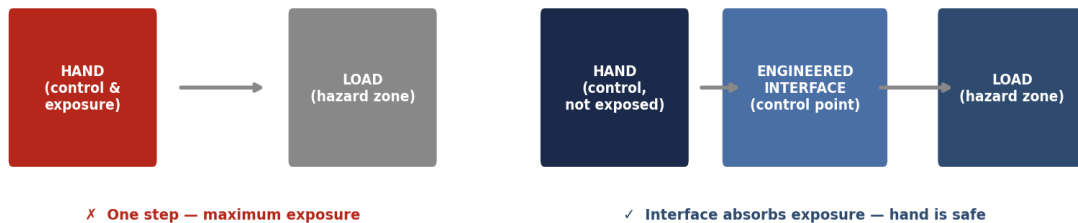
This is not a glove. A glove accompanies the hand into the hazard zone. An engineered interface is a physical mechanism that replaces the hand as the control point — allowing the task to be completed with precision while the hand remains outside the hazard zone.

- It **transfers control** — allowing the worker to direct the task without direct hand contact.
- It **maintains precision** — it does not sacrifice the accuracy the hand currently provides.
- It **introduces distance** — it creates physical separation between the hand and the hazard point.
- It is **task-specific** — designed for the particular geometry, load, and tolerance requirements of the task it replaces.

The Fundamental Model Shift: From Contact to Interface

Current: HAND → LOAD

Required: HAND → INTERFACE → LOAD



Conceptual model — illustrative

Why the Layer Is Missing

The engineered interface is absent not because it is technically impossible. It is absent because the system was never designed to require it. Safety design begins and ends with the hand — how to protect it while it performs the task. The possibility of removing it from the hazard zone is not part of the design conversation.

SYSTEM DIAGNOSIS

The gap in the current safety model is not a gap in effort or investment. It is a gap in the design frame. The system has been optimised around a constraint — that the hand must perform the task — that was never examined.

As long as the hand is the control point, the risk is embedded in the process. This holds true regardless of how sophisticated the PPE, how detailed the procedure, or how rigorous the training.

SECTION VI

Normalisation of Risk — How Risk Becomes Standard

SECTION VI — NORMALISATION OF RISK

How Unsafe Practices Become Standard Practice

The structural gap described in the preceding section has existed in most industrial task designs for years — often for decades. The answer to why it has not been addressed lies in how risk behaves over time when it does not produce frequent, visible consequences.

The Logic of Task Persistence

- The task functions. It produces the required output. Workers complete it without incident — most of the time.
- It is familiar. The workforce knows it. Supervisors know how to manage it.
- Redesigning it is disruptive. It requires investment, retraining, and a period of change.

Against these practical arguments, the theoretical concern that the task design contains embedded risk carries limited weight — particularly when the risk has not recently produced an injury.

The Normalisation Cycle: How Risk Becomes Invisible



Conceptual model — illustrative

The Statistical Reality of Endemic Risk

Infrequent failures mask endemic risk. The gap between incidents does not reflect the absence of hazard — it reflects the statistical distribution of harm across a population of repeated exposures.

Consider a task that exposes a worker's hand to a specific hazard on every cycle. The probability of injury on any given cycle may be low. Across repeated exposure cycles, the likelihood of an incident increases

materially over time. The system does not appear dangerous on any given day. Over time, the risk accumulates.

"The injury is not a surprise. It is an overdue statistical event."

"No incident" does not equal "safe system." It equals a deferred liability — one whose repayment date is determined by probability, not by the quality of the design.

The Organisational Consequence

When risk is normalised, it becomes invisible to the system that should be managing it. Safety conversations focus on the last incident, not on the structure of the next one. Corrective actions address the specific circumstances of the injury that occurred, not the design feature that made some injury probable.

Breaking the normalisation cycle requires an intervention that operates at the level of task design — before the task is executed, before the injury occurs.

SECTION VII

Redefining the Solution — What a Safety Tool Should Be

SECTION VII — REDEFINING THE SOLUTION

What a Safety Tool Should Actually Be Defined By

The persistence of hand injuries despite significant safety investment points to a definitional problem. If the tools being deployed are not producing the expected safety outcomes, one possibility is that they are not, in fact, safety tools — at least not in the sense that matters.

A More Useful Definition

A safety tool is conventionally defined by its properties: material, certification standard, hazard protection profile. These are necessary criteria. They are not sufficient ones.

A glove certified to the highest cut resistance standard is an excellent glove. But it does not answer the question of whether the hand should be in contact with a cutting hazard in the first place.

A safety tool should be defined by what it **removes** from the interaction between the worker and the hazard.

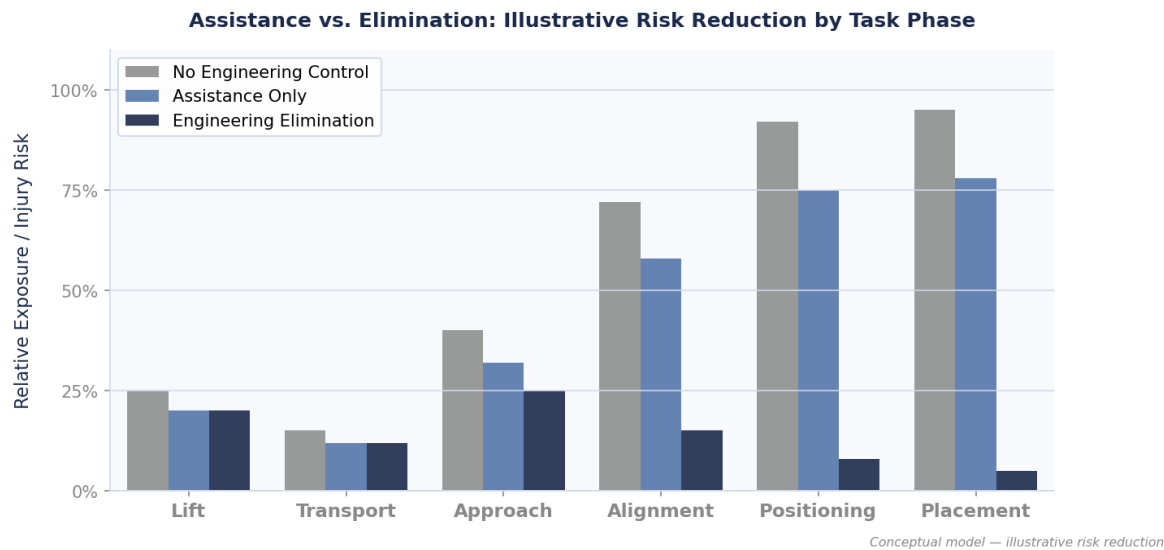
What the Tool Does	What It Actually Is	What It Solves
Reduces effort or physical strain	Ergonomic aid	Fatigue; musculoskeletal load
Makes the task easier or faster	Productivity tool	Operational efficiency
Reduces severity of injury if contact occurs	Protective tool (PPE)	Injury severity
Reduces frequency of hand-hazard contact	Safety tool	Exposure
Removes hand from hazard zone entirely	Elimination tool	Structural risk

By this framework, most tools currently deployed under the heading of hand safety are protective tools at best. Very few are elimination tools.

Assistance and Elimination Are Not the Same Outcome

Assisted handling — ergonomic grips, mechanical lifts, padded interfaces — reduces physical strain and improves operator comfort. These are genuine benefits. What they do not do is remove the hand from the hazard zone at the moment of maximum exposure. The hand is still there. The exposure is unchanged.

Elimination requires a different design question: not *how can we make this safer for the hand to do* — but *how can we redesign this so the hand does not need to be there?*



CHALLENGE FOR SAFETY PROCUREMENT

For every item in the current hand safety equipment list: what does it remove? If the answer is 'the severity of injury when contact occurs' — it is a protective tool. If the answer is 'the contact itself' — it is a safety tool.

SECTION VIII

The Engineering Model — The Interface Framework

SECTION VIII — THE ENGINEERING MODEL

Touch Feels Like Control. It Is Not a Safety Mechanism.

One of the most persistent barriers to redesigning the hand-task interaction is cognitive, not technical. Workers resist removing the hand from the final stage of a task because it feels less controlled.

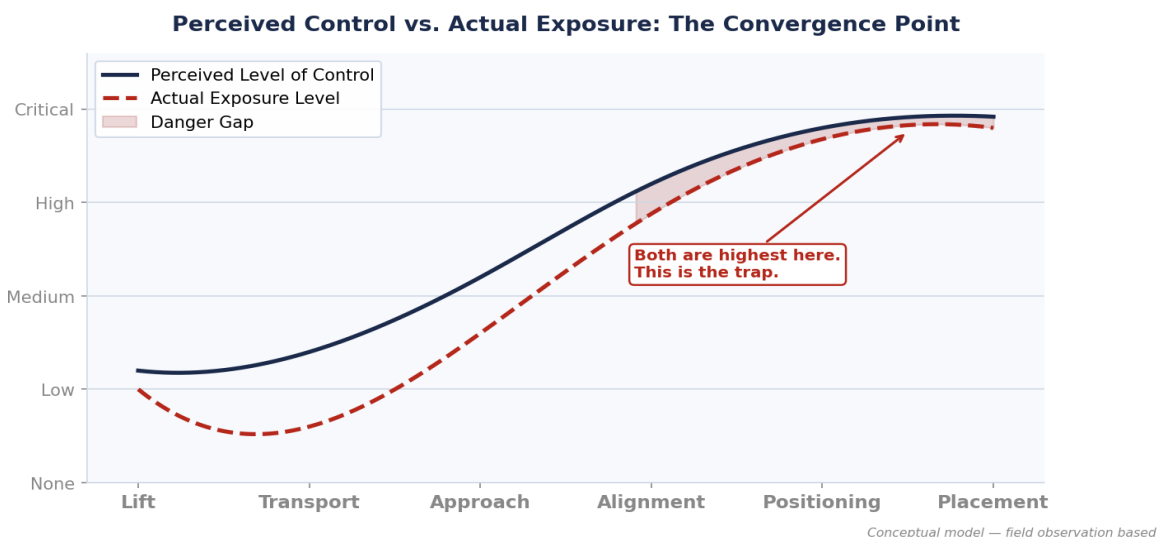
The hand is an extraordinary instrument of precision. It provides real-time proprioceptive feedback. It adjusts continuously to changes in load, surface, and position.

But precision is not safety.

The Convergence Problem

- The task feels fully controlled and manageable.
- The hand is at maximum proximity to the hazard.
- The probability of injury, if anything goes wrong, is at its highest.

Touch creates a subjective experience of control that is entirely compatible with objective maximum exposure. The feeling of being in control does not reduce the risk. It masks it.



Why Training Cannot Correct a Structural Condition

The tactile confidence problem is structural, not behavioural. Telling workers to be less reliant on tactile feedback does not give them an alternative control mechanism. The correct response is architectural: redesign the task so the hand is no longer required in the position where maximum precision and maximum exposure coincide.

DESIGN PRINCIPLE

The perception of control is not a reliable indicator of safety. The most controlled moment in a task is often the most dangerous one. Safety design must account for this — not by reducing control, but by moving the control point outside the hazard zone.

From Contact to Interface: The Fundamental Model Shift

CURRENT MODEL HAND → LOAD Hand is both control mechanism and exposure point. Control and risk are inseparable.	REQUIRED MODEL HAND → INTERFACE → LOAD Interface is the control point. Hand retains control but is outside the hazard zone.
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What Changes with the Interface

What Changes	Before Interface	After Interface
Control point	Hand — inside hazard zone	Interface — outside hazard zone
Exposure during control	Maximum — hand at hazard proximity	Minimal — hand displaced from hazard
Precision mechanism	Tactile feedback through contact	Designed geometry of interface
Variability management	Real-time reactive hand adjustment	Pre-engineered positional constraint
Injury risk at final stage	Highest in task cycle	Removed from task cycle

SECTION IX

Task Decomposition — Locating the Exposure Point

SECTION IX — TASK DECOMPOSITION

Locating the Exposure Point: A Structured Method

Engineering control cannot be specified without first knowing exactly where the hand enters the hazard zone and what it is doing there. This requires task decomposition — a structured analysis of the task phases to identify the specific moments of hand exposure.

The Standard Task Cycle

Phase	Description	Exposure Level	Primary Risk
1. Lift	Initial pick-up of the load from rest	Low–Medium	Overexertion; back load
2. Transport	Moving the load from source to destination	Low	Dropped load; fatigue
3. Approach	Bringing load to proximity of target position	Medium	Collision; loss of control
4. Alignment	Orienting load to match target geometry	High	Pinch; crush; entrapment
5. Positioning	Holding load in precise position during engagement	Very High	Sustained exposure; reactive crush
6. Placement	Final settling of load into target position	Very High	Entrapment; sudden shift; pinch

Exposure is not distributed evenly across the task cycle. It concentrates sharply in phases 4, 5, and 6. Safety investment directed at phases 1, 2, and 3 will not prevent the injuries that occur in phases 4, 5, and 6.

“The job doesn't stop. The hand stays in. That is the phase that matters.”

The Two Essential Questions

Question 1: Where does the hand enter the hazard zone in this phase?

Question 2: What replaces it?

The first question maps the exposure. The second defines the engineering requirement. If Question 2 cannot be answered, the task design should be considered incomplete.

If the hand is required inside the hazard zone, the task is not yet engineered.

The Engineering Control Hierarchy for Hand Safety

Level	Intervention	What It Achieves
1 — Elimination	Redesign task to remove hand from hazard zone	No exposure; no injury possibility
2 — Fixed guard / jig	Constrain load position mechanically	Exposure removed at constrained phase
3 — Positioning interface	Replace hand at final stage with designed mechanism	Exposure removed at peak-risk phase
4 — Movement interface	Control load path without hand guidance	Exposure reduced during approach phase
5 — Distance tool	Extend functional reach; hand displaced from hazard	Exposure reduced but not eliminated
6 — PPE	Protect hand that remains in contact with hazard	Injury severity reduced; exposure unchanged

Applying the Decomposition Model

1. Map the task phases using direct observation. What is actually happening, and when?
2. Identify all points of hand-hazard contact or proximity across all phases.
3. Assess exposure duration, proximity, and force at each contact point.
4. Prioritise the highest-exposure phases — typically alignment, positioning, and placement.
5. For each high-exposure phase, specify the engineered interface that removes hand contact.
6. Verify that the interface maintains the required precision and control.

IMPLEMENTATION NOTE

Task decomposition does not need to be an extended exercise. A structured observation of one to two task cycles — focused on hand position, contact duration, and load behaviour — is sufficient to identify the critical exposure points.

SECTION X

Implementation — From Framework to Practice

SECTION X — IMPLEMENTATION

From Framework to Practice: Closing the Gap

The engineering control framework set out in this paper is not a theoretical proposition. The gap between the current state and the required state is not primarily technical — it is organisational. Closing it requires changes in three areas: how tasks are specified, how safety equipment is defined and procured, and how safety performance is measured.

1. Reframe the Safety Specification

The current safety specification for a manual task typically defines the PPE required, the procedural requirements, and the training prerequisites. It does not define the engineered interface.

The specification must be extended to include:

- A task decomposition identifying all phases of hand-hazard contact or proximity.
- An exposure assessment for each contact phase — duration, proximity, and load behaviour.
- An interface specification for each high-exposure phase — what mechanism replaces the hand and how it maintains control.

If an interface cannot be specified for a high-exposure phase, the task design should be flagged as incomplete. The absence of a specified interface means the risk remains embedded in the task.

2. Redefine What Counts as Safety Equipment

Current procurement systems classify safety equipment primarily by the hazard it protects against. This directs investment towards protective equipment. Procurement systems should be extended to include elimination equipment — tools and mechanisms whose function is to remove hand contact from the hazard zone, not protect the hand that is in it.

3. Measure What the System Is Actually Controlling

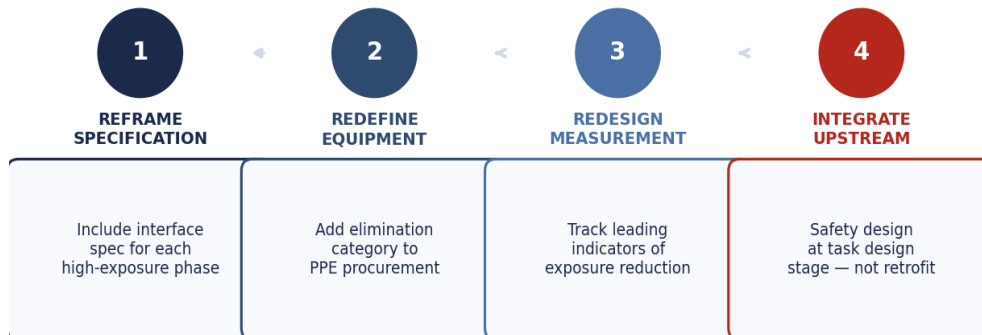
Safety performance in most organisations is measured through incident metrics: LTIFR, TRIFR, near-miss rates. These measure injury occurrence. They do not measure system quality.

Leading indicators of engineering control effectiveness should be tracked alongside lagging metrics:

- Proportion of high-exposure task phases with specified engineered interfaces.
- Interface availability and usage rates at point of use.
- Reduction in hand-hazard contact duration per task cycle.

- Proportion of tasks redesigned to Level 1–4 in the engineering control hierarchy.

Implementation Roadmap: From Framework to Operational Practice



Conceptual model — illustrative

4. Integrate Safety into Task Design — Not Retrofit It

Engineering control is most cost-effective when built into task design from the outset — before operational habits are established, before tooling is fixed, and before the first injury makes the redesign both necessary and more difficult.

This requires safety to have a formal input at the task design stage. In most organisations, safety review occurs after the task has been designed — as a compliance check, not a design input.

IMPLEMENTATION PRINCIPLE

The question 'what interface replaces the hand at the final stage?' should be asked and answered at the task design stage — not after the first incident, not during a safety audit, and not in response to a regulatory requirement.

SECTION XI

The Future of Hand Safety — Structural Change

SECTION XI — THE FUTURE OF HAND SAFETY

The Next Advance Is Structural, Not Incremental

The history of hand safety progress is a history of incremental improvement: better materials, better standards, better training, better incident management. Each advance has been real. Each has moved the industry forward.

The next advance will not be incremental.

The industry has reached the practical ceiling of what can be achieved by optimising within the current model. Continuing to invest in the same categories of intervention will produce diminishing returns — not because the interventions are poorly designed, but because they are operating on a problem they cannot structurally resolve.

What the Next Stage Is Not

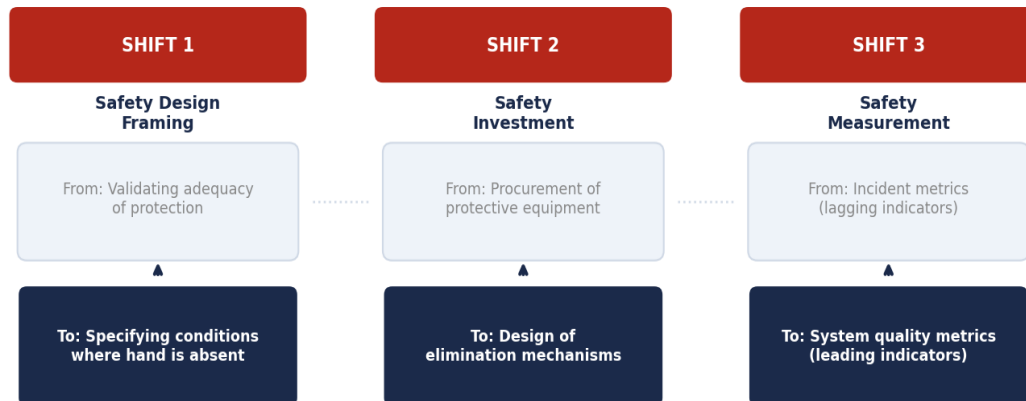
- It is not better PPE. The PPE industry has produced outstanding products. Further advances will be marginal.
- It is not more comprehensive training. Training cannot eliminate a structurally embedded risk.
- It is not more detailed procedures. Procedures govern behaviour within a task design. They cannot compensate for a task design that requires the hand to be in a hazard zone.

What the Next Stage Is

The next stage of hand safety is the systematic redesign of industrial tasks so that hand contact in hazard zones is not managed, not mitigated, not compensated for — but engineered out.

This requires three structural shifts:

Three Structural Shifts: From Protection Model to Engineering Control



Conceptual model — illustrative

The Standard That This Requires

Progress requires accepting a more demanding standard for what constitutes a safe task.

The task is safe when the hand is not required in the hazard zone — not merely when it is protected while it is there.

By the current standard, most task designs pass. By this standard, most do not. The difference between the two standards is the frontier the industry now needs to cross.

CLOSING STATEMENT

The Hand Has Been Protected Long Enough

Hand injuries persist not because organisations do not care, and not because workers are careless. They persist because the systems designed to prevent them are built around a premise that cannot produce the outcome they are designed to achieve.

Protecting the hand is not the same as making the hand safe. Making the hand safe requires removing it from the hazard — not equipping it to endure the hazard more effectively.

What This Means in Practice

- Asking a different question at the task design stage: not *how do we protect the hand*, but *why is the hand there*.
- Treating the engineered interface as a design requirement, not an optional upgrade.
- Measuring safety system quality by the structural conditions it creates, not only by the incidents it fails to prevent.
- Accepting that a system with no recent incidents may still contain significant embedded risk.

What This Requires from the Industry

It requires safety professionals to bring engineering thinking to what has historically been treated as a behavioural problem.

It requires organisations to invest in task redesign at the same level of rigour and resource commitment currently applied to PPE and training.

It requires the industry to acknowledge that the current model — characterised by PPE at the base of a hierarchy that is rarely applied in full — is not the destination. It is a point of departure.

***As long as the hand remains the control point,
the risk remains in the process.***

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