



HIDDEN COST OF INCIDENTS

In an industry where operational efficiency and uptime are critical, safety is often approached through regulatory compliance. However, according to Richard Phillips, mechanical engineer at Casper, Phillips & Associates Inc., meeting minimum standards is no longer sufficient. Across ports and terminals worldwide, the true cost of crane related incidents suggests that a more proactive and data driven approach is essential.

Many accidents involving ship to shore container cranes remain out of public view. Within insurance data, however, a clear pattern emerges. Regulatory requirements represent a baseline, but they do not fully reflect operational risk. The financial impact of recurring incidents highlights where improvements are needed. Insurance claims provide a useful benchmark. When stack collisions account for around ten percent of total claim costs, the issue becomes significant. At that level, it is not a marginal concern but a major operational risk. Understanding where losses occur allows operators to prioritise safety investments and implement systems that address the most frequent incidents.





CONTAINER CRANES

DATA DRIVING CHANGE

A recent report from TT Club, International Cargo Handling Coordination Association, and Port Equipment Manufacturers Association reinforces this view. Based on data from more than two thousand insured operations, including over four hundred ports and terminals, the report offers a detailed picture of crane related risks.

One of the most striking findings is that boom to vessel collisions represent the largest category of insurance costs, accounting for roughly a quarter of all claims. The consequences can be severe. In one case, a damaged crane boom required six months of repairs costing around two million dollars, alongside six million dollars in lost revenue.

Many terminals still rely on trip wire systems for boom collision prevention. These systems can require intensive maintenance and may not react quickly enough at higher gantry speeds. More advanced electronic systems provide a stronger level of protection, using warning zones to slow movement and stop zones to prevent impact. These systems can also prevent crane to crane collisions, detect rail obstructions and support stack profiling.



DESIGNING FOR EXTREMES

Cranes must also be prepared for extreme events. In seismic regions, specialised engineering solutions are required. Casper, Phillips & Associates Inc. has developed a crane base anti seismic isolation system based on non-linear time history analysis, designed to protect structures during major earthquakes. Systems such as this are already in use in seismic zones.

Environmental conditions vary from site to site, and crane design must reflect this. A standard approach is no longer sufficient for a global industry operating in diverse conditions.



SPECIFICATION MATTERS

The specification stage is where crane safety is truly defined. This is when operational, environmental and safety requirements are set out. If specifications only reference regulatory minimums, manufacturers will typically deliver only what is required.

Original equipment manufacturers work within commercial constraints. Additional safety systems increase costs, and without clear instruction from the purchaser, they are often excluded to remain competitive. This creates a critical gap. If a feature is not specified, it is unlikely to be included.

One example is the consideration of parking wind conditions. Cranes must sometimes move to a safe position under wind loads higher than normal operating limits. Enhancing gantry drive and braking capacity to manage these conditions can reduce the risk of uncontrolled movement. Wind related incidents account for approximately eleven percent of global crane claim costs.

Another key feature is hoist emergency brakes. These systems prevent single points of failure in critical components. Without them, mechanical failures such as gearbox or coupling damage can lead to load drops.



RAISING INDUSTRY STANDARDS

Organisations such as Port Equipment Manufacturers Association play an important role in advancing best practices. By sharing data and industry insight, they help improve understanding of risks and technological developments across the sector. Engineers remain central to this process, contributing not only to design but also to the development of safety systems and standards. Their expertise, combined with industry wide data, provides a strong foundation for improving crane safety.

For crane purchasers and operators, the message is clear. Safety should not be limited to compliance. It requires a deeper understanding of risk and a willingness to go beyond minimum requirements.

The specification document becomes a key tool. It defines not only what a crane can do, but how safely and reliably it will operate over time. Decisions made at this stage have lasting consequences for both performance and risk exposure.

As the industry evolves, the focus is shifting. The question is no longer what is required, but what is necessary to ensure safe and efficient operations.