

FIXED AND FLOATING OBJECT DAMAGE IN CONTAINER TERMINALS

Despite their size, ship to shore cranes are comparatively delicate structures and are easily and frequently damaged. The management of these losses can be complex and their cost significant, ranging from USD 2 million to USD 10 million or more plus any consequential loss. Having investigated and advised on numerous crane damage claims Keith Charles, a Marine Civil Engineer with Integra Technical Services, considers some of the key claims management stages and issues.

Container ship carrying capacity has increased by more than 1,400% over the past 60 years, requiring ever larger ship to shore cranes to provide a fast and efficient loading and unloading service. The original quayside crane built in 1959 was designed to lift 23 tonne boxes, 16 metres over rails with an outreach of 24 metres. New Megamax cranes that service the latest Ultra Large Container Vessels have 85 tonne lifting capacity, 52 metres over rails and with an outreach of 72 metres. To put that into perspective, it is the equivalent of 24 containers side by side and up to 10 high on deck.

04 INSPIRATION

Catastrophic incidents

When these cranes are damaged the first consideration is whether repair is possible or if the crane is a constructive total loss (CTL), having toppled. Catastrophic incidents require the safe demolition and removal of the crane from the berth. This can be a difficult operation especially if the crane has fallen onto an adjacent crane or if the berth's structure has been damaged and weakened. Complexities increase if the terminal is in a remote location, particularly if the required heavy lift equipment and specialised expertise is not available.

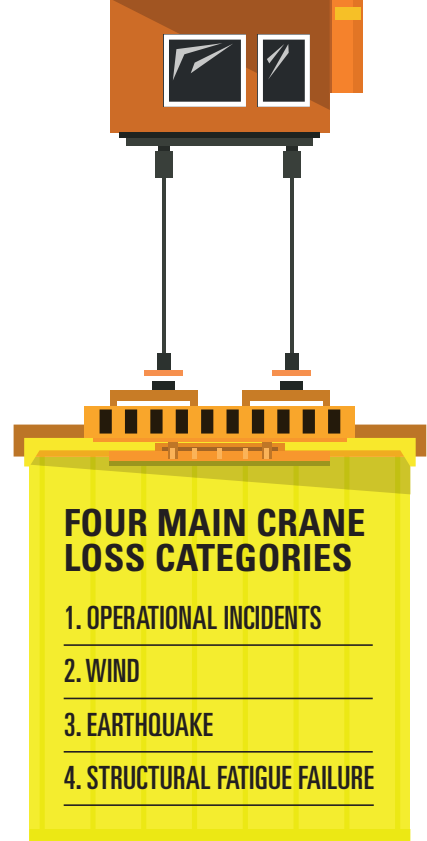
As the demolition and recovery is managed, decisions need to be taken about the replacement. Do you replace the crane with an equivalent used one or install a new crane? The search, assessment and cost of a used crane is time consuming and can often result in little cost difference between used and new when all the additional costs for modification, transportation and installation are included.

Repairable damage

Repairable incidents usually result from the derailing of the long travel gantry system or deformation in the crane's frame and involve two main phases; recovery, and repair and recommissioning.

The recovery phase demands an initial survey, stabilisation of the crane and the isolation and containment of the damaged crane(s) to enable ongoing terminal operations. It is important at this stage to put in place corrective procedures that avoid unnecessary property and business interruption costs, or further damage to the crane or berth.

Once this has been achieved and notifications and initial discussion with insurance and port authorities are carried out, a more detailed structural survey and damage assessment can be performed to allow the repair and re-commissioning of the crane to proceed. This will normally involve parties representing both the vessel and terminal.



A Finite Element Stress Analysis (FEA) assesses the extent of damage and whether the repair is commercially viable taking account of the remaining useful life of the crane. Since cranes are not designed to withstand horizontal impact forces this analysis helps to identify the extent of the structure that has been affected in the incident, any points of damage previously unseen and the correct points of support required during the repair.

Repair and recommissioning

Repairs may take place on the rails or frequently, if more practical and convenient for the terminal, the crane is moved. If the crane is to be moved, temporary supports will be required to reinforce it for the move and a system for moving the crane from its damaged location to the place of repair will need to be installed. Care needs to be taken to avoid further damage to the crane or berth during this operation.

FIVE REASONS CRANES ARE VULNERABLE TO DAMAGE	1. POSITION CLOSE TO THE EDGE OF THE QUAY, SUSCEPTIBLE TO CONTACT WITH THE VESSEL	2. SIZE VISIBILITY AND CONTROL INCREASINGLY DIFFICULT FOR THE OPERATOR
	3. MAINTENANCE CAN LEAD TO FAILURE OR ESCALATION OF DAMAGE IN AN ALLISION INCIDENT	4. OPERATION POOR PROCEDURES CAN RESULT IN CRANE BOOM COLLISIONS

*e.g. berthing position or boom luffed when not in operation

Repairs to the crane's structure normally involve cutting away and replacing the damaged plating. This operation should allow the distorted structure to recover its original form, but jacking or heat application may also be needed. These repairs are frequently carried out at height on the crane's leg, which is a slow and costly operation.

If the crane's leg or frame is twisted or deformed the leg(s) will need to be supported from a tower to relieve the load in the legs whilst the corrective repairs are undertaken. However, if the leg is straight, an expensive tower support is not required and local structural support (stiffening) can be used to transfer the loads across the damaged section of the leg.

The most frequent crane damage incident is to the boom, which can be problematical and costly if the boom needs to be taken down for repair, as the boom's positional height and weight will require the mobilisation of a large mobile or floating crane. Damage to a crane's electrical system can also occur if the power supply trailing cable is pulled out of its protective trench (Panzerbelt) and over-stretched or broken, which can result if the crane is derailed. The cable reel can also be vulnerable to being hit directly and crushed or bent if it is located on the seaward leg. These items have long delivery times and to avoid delay in re-commissioning the crane an order for a new cable or cable reel should be placed early in the repair process.

The final stage in the repair and re-commissioning process involves

non-destructive testing (NDT) of the repaired areas and other critical weld joints that may have been affected in the incident and load testing. Crane geometry dimensional checks will, also, be performed for perpendicularity, diagonal tolerance and boom hinge alignment.

Resolving conflicts between parties

It is completely normal for there to be conflicting issues between the parties and these usually revolve around the method of repair and its influence on quantum. The prompt site attendance by an experienced surveyor can prove to be a key factor providing a smooth claims management process and avoiding potential conflict by capturing contemporaneous evidence, providing expert opinion and importantly establishing an open dialogue around the key issues from the beginning.

GETTING THE VALUATION RIGHT

It is commonplace for cranes to be insured against 'All Risks' of physical loss or damage and for this to extend to include Business Interruption suffered because of the loss of use of the crane and through port blockage. Whilst the cover afforded by these policy wordings is generally broad, the crane valuation can sometimes lead to underinsurance.

According to Daniel Wells, Associate Director of the Ports and Terminals/ Marine Liability Division at International Insurance and Reinsurance Broker Tysers "the Insured should carefully consider and understand the basis of their valuation. Under most insurance policies, the insured value should be the true 'reinstatement value' meaning what Insurers will pay to

reinstatement the Insured to the same position they were in before the loss occurred."

Where the replacement value of a crane is under-estimated this can be the result of a failure to properly account for substantial procurement and transportation costs. As Dan explains, "if the Insured simply lists the market value then this can lead to under-insurance particularly if there is an Average Clause contained in the wording whereby Average is applied, reducing the claim payment for replacement or repair."



Keith Charles

Marine Civil Engineer,
Integra Technical Services

A senior civil engineer with over 35 years' experience in the marine and offshore oil & gas industries, Keith provides specialist civil engineering consultancy services to P&I Clubs, insurance companies, lawyers, ship owners, port owners and operators, and other members of the maritime engineering community.

His principal activities concern the survey of damages to marine structures and mechanical handling equipment on a worldwide basis. Typical services involve providing engineering advice on the scope of damage, methods and costs of repair, review of business interruption and loss of use claims and when required, management of the repair works.