TT Club identifies where to focus on loss prevention

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Analysis of insurance claims

Data used in the analysis was based on the 2006 calendar year, covering all TT Club members (over 2000) which include over 400 Ports and Terminals globally. The data is based on claims records under claim rule 'Handling Equipment' and 'Property.' Some equipment damage is categorised under other rules, so there will be more equipment claims than are shown in this analysis. However, it highlights the salient issues.

Claim cause types

When analysing all claims, they can be categorised into four high level cause types:

- Human error (due to any person working on site – includes ships, contractors and outside truck drivers)
- Equipment failure (normally due to poor maintenance procedures)
- Weather (some claims due to weather can be prevented but not all)
- Miscellaneous – normally beyond the terminals control (eg. flatrack of bricks collapsed onto fork; load in container shifted; tines on fork snapped due to faulty manufacture)

Tables 1 and 2, show that human errors are the cause of over 70 per cent of claims. This is not new to most people. In fact when analysing all claims, not just equipment damage claims, human error accounts for 80 per cent to 90 per cent. The cost figures are similar to the figures based on the number of claims by coincidence only. So, based on both the number of claims and cost of claims, the focus in Loss Prevention needs to be on human errors and equipment failures.

Human error cause types

When the human errors are analysed it identifies what areas of the operation or what people are involved in the errors. The following categories have been used to highlight the human error type:

- Quay Crane (QC) driver (mainly hitting ship and damaging spreader when stuck in cell guides – spreader damage is always an issue of who is to blame – terminal maintenance and ships blame QC driver for getting spreader stuck and trying forcefully to pull spreader out resulting in spreader and cell guide damage – QC drivers blame cell guides)
- Reachstacker/forklift/lift trucks/top loaders (RS/Fork) driver (mainly collisions or tipping over or tipping forward)
- Rubber Tyred Gantry (RTG) driver (mainly collisions – hitting things left in RTG path)
- Straddle Carrier (SC) driver (mainly collisions with other straddle or the stack, although it is most costly when vehicle overturn)
- Ship (mainly ship running into wharf and occasionally hitting quay cranes which is the most costly scenario.)
- Truck driver (includes all other vehicles other than above, including own staff, third party and external trucks)
- Other (eg. Contractors; incorrect maintenance procedure; nuts left in electrical cubicle caused short circuit and fire; lashers; planners; other stevedores)

TABLE 1: 2006 HANDLING EQUIPMENT AND PROPERTY (% OF CLAIMS PER CAUSE TYPE)

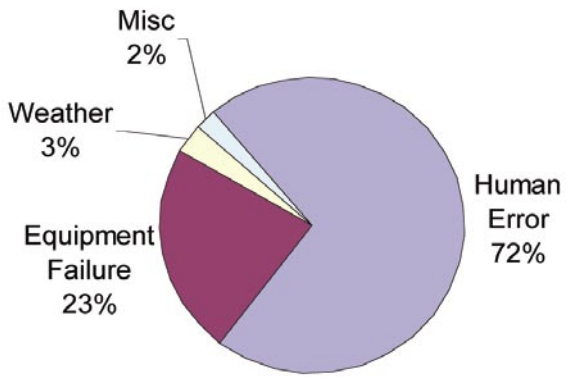
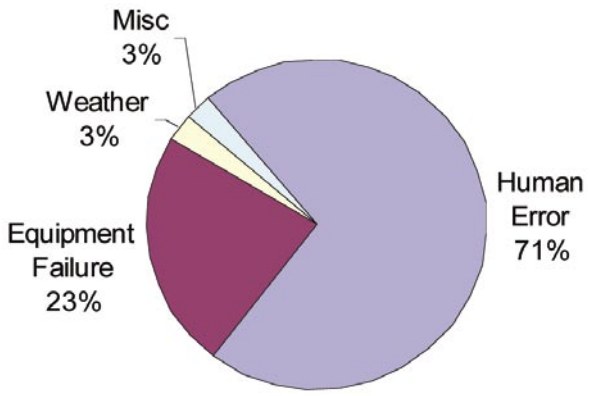


TABLE 2: 2006 HANDLING EQUIPMENT AND PROPERTY (% COSTS PER CAUSE TYPE)



Tables 3 and 4, show the claims categorised in human error type. In this case the number of claims (Table 3) does not reflect the cost of claims (Table 4). The largest number of claims are from damage caused by truck drivers and RS/fork drivers, however the cost of this damage is small compared to the value of damage caused by SC drivers (mainly overturning and writing off the machine (replacement cost ~US$800,000). The highest equipment damage costs relate to Straddle Carriers (35 per cent), ships (30 per cent) and Quay cranes (12 per cent) and these are discussed in more detail later.

Loss prevention action types

After identifying the cause type, the next step is to identify what loss prevention action can be done to ensure the incident does not happen again. A loss prevention action type can be identified for all incidents as follows:

- Training

TABLE 3: 2006 HANDLING EQUIPMENT AND PROPERTY (% OF CLAIMS CAUSED BY HUMAN ERROR TYPE)

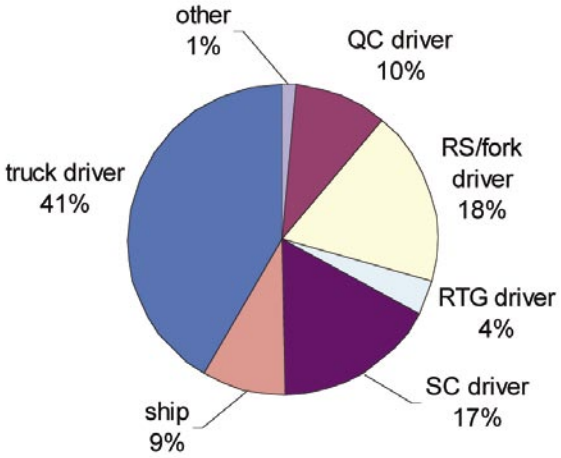
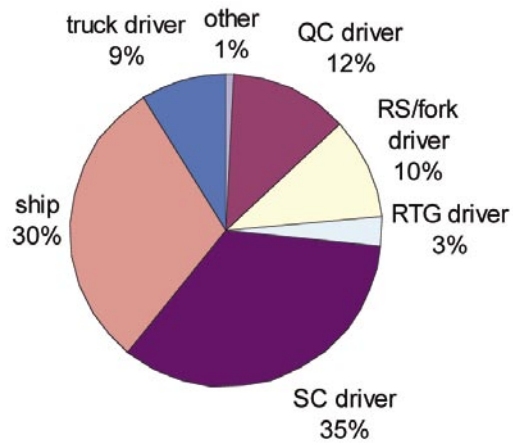


TABLE 4: 2006 HANDLING EQUIPMENT AND PROPERTY (% COSTS OF HUMAN CAUSES)



- Procedures (eg. Procedures to stop theft; procedures to ensure only properly inducted people are allowed on site; storm tie-down procedures; one-way traffic flows etc)
- Re-design or engineering out problems or providing a back-up to operators (boom anti-collision systems to back up QC driver error; better braking systems to stop damage due to windstorms)
- Maintenance (better maintenance systems and procedures to minimise equipment failures)
- Other (this covers things we cannot control – eg. extreme weather – however some claims caused by weather can be prevented)

Table 5 and Table 6 show all claims categorised into loss prevention action types.

Specific training, procedures, re-design or maintenance actions can be identified for each incident. We all make mistakes and no amount of training will eliminate all errors. So although training is very important we must also look at what procedures or engineering changes can be made to mitigate the risks or provide a backup for the operators/drivers. So the long term aim is to identify safer procedures and re-design solutions to reduce the reliance on training.

The following provides more detailed discussion on the three highest equipment damage cost cause types.

Straddle carrier incidents

Even though there are a larger number of claims due to truck or vehicle incidents, the cost of Straddle Carrier incidents is much higher. They account for 17 per cent of the number of equipment claims and 35 per cent by value of equipment claims. They are the biggest single equipment damage cost. This is because many of the straddle carrier incidents are rollovers and when a straddle rolls over it is normally a write off and they cost around US$800,000 each.

Tables 7 and 8 show a more detailed breakdown of the Straddle carrier incidents. 'SC/SC collision' is two straddles colliding. 'Other collisions' include hitting other vehicles or hitting a container in the stack, particularly when cutting corners etc.

Straddle incidents as with most equipment damage incidents and other incidents caused by human error appear to be increasing. There are a couple of factors which have influenced this. One reason for this is that there is more equipment in operation. Another reason which is often cited by many, is that as terminal throughputs have increased in recent years and capacity has lagged behind demand (which is often the case), the utilisation of equipment is above normally acceptable levels. This creates two problems. Firstly, maintenance is often neglected because of limited access to the equipment because it is always needed for operations. This can result in unsafe equipment or equipment which more often breaks down, both of which can cause damage and/or injury. Secondly, with over-utilised equipment, and the pressure on operations to continually improve performance in today's competitive world, there is concern this can often lead to unsafe procedures and work practices. In general, to help mitigate all equipment incidents terminals need to ensure that capacity matches or exceeds demand.

TABLE 5: 2006 HANDLING EQUIPMENT AND PROPERTY (% OF CLAIMS PER LOSS PREVENTION ACTION TYPE)

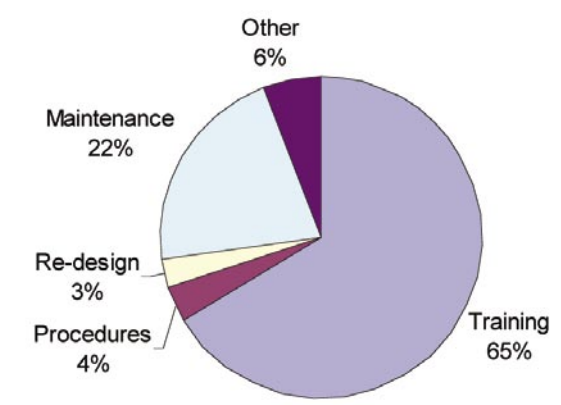


TABLE 6: 2006 HANDLING EQUIPMENT AND PROPERTY (% COST SAVINGS BY LOSS PREVENTION ACTION TYPE)

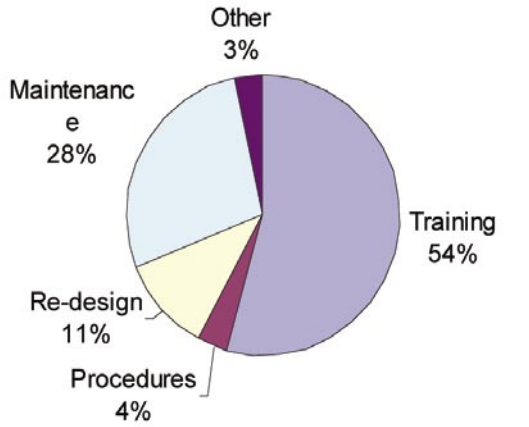


TABLE 7: 2006 STRADDLE CARRIER INCIDENTS (% NUMBER BY CAUSE TYPE)

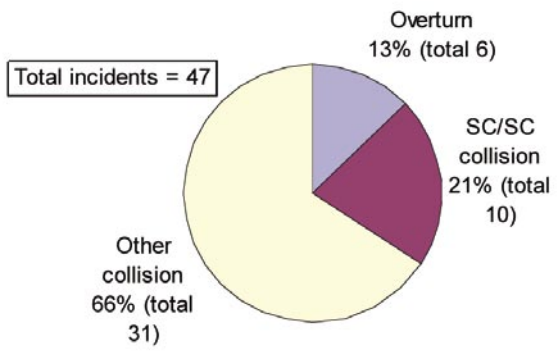
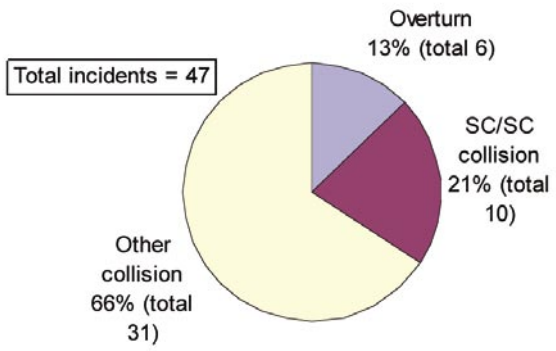


TABLE 8: 2006 STRADDLE CARRIER INCIDENTS (% NUMBER BY CAUSE TYPE)



Because of the high frequency and cost of straddle incidents of which the terminal industry is now aware, there are a lot of groups currently looking at how to address these incidents. The TT Club is part of a number of these groups and is proactive in working with its members to help in their loss prevention activities. Although the members are generally insured for these incidents, no insurance cover can compensate for the safety of the workforce.

Below is a list of loss prevention actions to help mitigate Straddle Carrier incidents. It is not an exhaustive list and they are not all solutions, some are unanswered questions, but it highlights what things we need to focus on.

1. Training:

- T&B of operators
- SC operators should be trained, authorised, competent, mature and fit before being authorised to operate – there have been some situations where 18 year olds, who did not even have a vehicle driving licence, were permitted to work
- Should driver simulators be used to increase competency levels? Simulators are sometimes used for quay crane drivers but are not common for SC drivers

2. Procedures

- Efficient and safe traffic layout/management/yard systems
- One-way traffic flows
- Adequate width of roadways
- Adequate width of intersections to help prevent collisions with stacks when turning
- Terminal speed limits including much lower speed limits when turning corners

3. Re-design:

- Ensure new SC designs are safe and stable. Engine placement is critical
- Speed limiters
- Turn angle limiters based on speed and spreader height
- Reflective markers on legs and parts of Straddle
- Black boxes (to track containers, identify employees, shock monitoring, track movement through GPS, trip recording etc). With driver identification, drivers tends to do the right thing when they know they can de identified when incidents occur
- Are SC's built to an ISO standard? Is the standard adequate or limited in scope?

4. Maintenance

- Regular maintenance inspections and servicing
- Correct tyres and tyre pressures
- Yard surface quality and maintenance – no potholes, no oil on surface
- Yard gradients – minimum slopes and level yards with no cambers

Ships colliding with wharves

It is interesting to note from Table 4 the second highest cost is damage caused by ships. The number of insurance claims due to ships colliding with wharves was nine per cent. However the cost was 30 per cent due to the high cost of wharf repairs and crane replacement (US$6m to US$8m). In 2006 this cost was mainly the result of wharf damage. However due to the high frequency of ships hitting wharves, the risk of a Quay Crane being hit is high. This type of incident has occurred many times in the last few years and has resulted in fatalities as well as high equipment replacement and business interruption costs. Some ports and terminals 'park' the quay cranes in specific positions on the berth when a ship is berthing or de-berthing (mainly at ends). However the benefits of this are uncertain. There is little regulation on berthing and de-berthing procedures which are normally dependent on the Harbour Master. Ships hitting wharves is a major issue that needs to be addressed in the maritime and ports industry. These incidents are often overlooked by terminal insurers as they can normally recover costs from the ship insurer. However, recovery is not normally 100 per cent and as in any insurance claim, money does not fully compensate for all the consequences, especially injuries.

Quay cranes colliding with ships

The third highest cost of equipment claims is due to quay cranes hitting ships (12 per cent). The boom of a quay crane colliding with the structure or equipment of a ship is an ongoing and widespread occurrence at almost every port around the world. This type of incident can result in serious injuries to workers and be very costly to our members in repairs and operational downtime. A recent incident in the UK caused several million Pounds of damage to the quay crane boom and ship's crane, as well as major business interruption due to a quay crane being out of service for six months. The frustrating thing is that this type of incident can be almost entirely prevented with the installation of modern sensors. With the potential high cost and occurrence of these incidents it is a very good investment to retro-fit to sensor bomm anti-collision systems existing cranes and ensure they are fitted to all new cranes.

Most new quay cranes today have some form of boom anti-collision system installed. In principal, two types of systems are used, trip wire and electronic sensors. The trip wire is the simplest and consists of wires running along the length of the boom on both sides and protruding about one to two metres out from the boom. If these wires are hit, they activate a limit switch which stops the crane long travel. Depending on the travel speed it may not completely stop the crane fully before a collision occurs. This system is better than nothing, but does not provide the level of protection afforded by electronic sensing devices. There are a number of different sensing devices that have been tried. At present, the sensors utilised most are a laser based unit supplied by Sick Sensor Intelligence and a radar based unit supplied by Navtech Electronic Ltd. These sensors allow programming to provide separate warning, slow down and stop signals to help prevent collisions. One issue with the sensor units is that they need to be kept clean so when installing allow for ease of access. Also, a substantial mounting system is important to ensure vibration does not fatigue the mounting or cause operational errors. Another problem with the laser unit is that it is affected when the sun is directed into the laser sensor. If your boom points east or west you may have periods in the morning or afternoon when the sensor is inoperable. This issue has been resolved by Sick but you need to get them involved rather than rely on a third party. Some disadvantages of the radar sensor are its expense relative to other units and dead zones created by the trolley when using only one sensor.

Conclusion

Most claims analysis in the insurance industry is focused on determining the cause of an incident to identify who is liable. This is necessary and the main role of a claims executive. However the TT Club is also working closely with its members to determine the root cause of an incident to enable loss prevention actions to be identified to ensure the incident does not happen again. The above discussion on claims analysis and loss prevention actions is part of the continuous improvement process. Sharing information is also part of the process and is the aim of this article. 95 per cent of the issues that one terminal have are the same as the next terminal. By sharing information and solving problems together we can save the industry time and money. Where safety is concerned we should not worry about loss of any competitive advantages between companies but ensure we all work together and share information to make the industry safer and this in turn will save money for all.

ABOUT THE AUTHOR

Laurence Jones is a qualified engineer with extensive engineering, maintenance and operations experience in the global ports and terminals industry. He worked 26 years for BHP Billiton in the steel, open cut and underground mining industries, and engineering design and construction. His last 15 years with BHP was in bulk materials terminals. He then spent eight years in container terminals with P&O Ports and attained the role of General Manager Global Engineering and Asset Management before joining the TT Club as Director of Global Risk Assessment. His role in the TT Club covers internal advice and support in underwriting decisions and claims assessment, and externally he manages Third party loss prevention surveys and works proactively with clients and industry to identify areas where risks may be reduced. Laurence is based in Sydney, Australia and travels to TT Club global offices and client sites on a regular basis and as required.

One of the first things Laurence did in his new role was to identify the main causes of equipment claims and determine the areas where loss prevention needs to focus.

ABOUT THE COMPANY

The **TT Club** is the international transport and logistics industry's leading provider of insurance and related risk management services. Established in 1968, the Club's membership comprises ship operators, ports and terminals, road, rail and airfreight operators, logistics companies and container lessors. The TT Club has over 2,000 members which include over 400 Ports and Terminals globally. As a mutual insurer, the Club exists to provide its policyholders with benefits, which include specialist underwriting expertise, a world-wide office network providing claims management services, and first class risk management and loss prevention advice. One of the key differentiators of the TT Club is its focus of providing Loss Prevention support to its members. To strengthen this focus on loss prevention, Laurence Jones was recruited in December 2006.

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