

## Selecting the Best Risk Exposure to Assess Collision Risks in Container Terminals

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**Abstract :** About 90 percent of world merchandise trade by volume being carried by sea. Maritime transport remains as backbone behind the international trade and globalization meanwhile all seaborne goods need using at least two ports as origin and destination. Amid seaborne traded cargos, container traffic is a prosperous market with about 16% in terms of volume. Albeit containerized cargos are less in terms of tonnage but, containers carry the highest value cargos amongst all. That is why efficient handling of containers in ports is very important. Accidents are the foremost causes that lead to port inefficiency and a surge in total transport cost. Having different port safety management systems (PSMS) in place, statistics on port accidents show that numerous accidents occur in ports. Some of them claim peoples' life; others damage goods, vessels, port equipment and/or the environment. Several accident investigation illustrate that the most common accidents take place throughout transport operation, it sometimes accounts for 68.6% of all events, therefore providing a safer workplace depends on reducing collision risk. In order to quantify risks at the port area different variables can be used as exposure measurement. One of the main motives for defining and using exposure in studies related to infrastructure is to account for the differences in intensity of use, so as to make comparisons meaningful. In various researches related to handling containers in ports and intermodal terminals, different risk exposures and also the likelihood of each event have been selected. Vehicle collision within the port area ( $10^{-7}$  per kilometer of vehicle distance travelled) and dropping containers from cranes, forklift trucks, or rail mounted gantries ( $1 \times 10^{-5}$  per lift) are some examples. According to the objective of the current research, three categories of accidents selected for collision risk assessment; fall of container during ship to shore operation, dropping container during transfer operation and collision between vehicles and objects within terminal area. Later on various consequences, exposure and probability identified for each accident. Hence, reducing collision risks profoundly rely on picking the right risk exposures and probability of selected accidents, to prevent collision accidents in container terminals and in the framework of risk calculations, such risk exposures and probabilities can be useful in assessing the effectiveness of safety programs in ports.

**Keywords :** container terminal, collision, seaborne trade, risk exposure, risk probability

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