

## SSA Marine – RTG proximity system

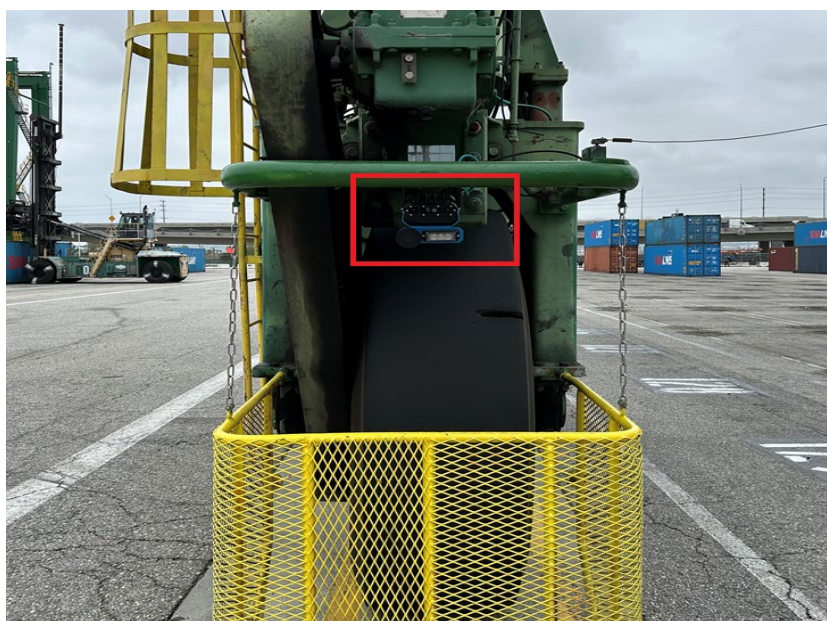
AI driven camera system on RTGs to identify pedestrians and vehicles within the travel zone with automated responses depending on proximity including alarms and fail-safe halt function

### *the challenge*

One of the critical risks that is present within SSA Containers affiliated operations is the risk of plant vs pedestrian worker incidents and accidents. This is especially true for SSA Containers affiliated terminals where there is a significant amount of plant operating near workers, particularly RTGs. This proximity of operation has created a risk where workers can be fatally struck by an RTG when inspecting containers or machinery within the terminal. Several controls (e.g. wheel guards) have already been installed on RTGs to combat this risk however so far none have been fully effective in preventing workers being run over by RTGs.

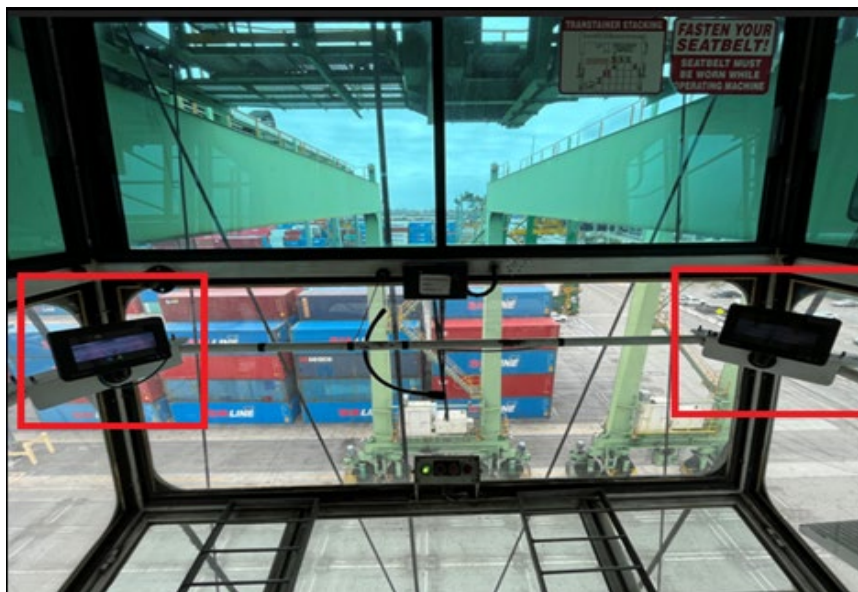
### *the innovation*

SSA Containers affiliates have partnered with a company called Strata to explore an AI driven camera system. This involved the installation of 4 cameras, one on each leg of the RTG. In addition to the cameras, a flashing strobe, 100 dB alarm, and camera screen for the operator was fitted. Strata's system uses the cameras to identify pedestrians and vehicles within the travel zone. The system has three zones (red 0, yellow 1, and green 2) of detection with automated responses to each zone. If a worker and/or a vehicle is detected in a green zone the RTG operator is made aware of the zone breach on the screen inside the cab. If a worker or vehicle is detected in the yellow zone, then an alarm is sounded to alert both the worker on the ground and in the cab.



Location of cameras on RTG

RTG will enter a slow down mode if yellow zone is breached by a pedestrian or vehicle. If they enter the red zone, then the machine automatically comes to a halt to prevent the worker from being run over or a vehicle from being struck. The camera system has both conventional cameras and infra-red cameras to allow for full detection during both day and night, as well as during inclement weather.



Monitor position in RTG cab

*how it was implemented*

SSA Containers affiliates partnered with Strata to implement the system on 1 of their RTGs at a Long Beach terminal. A trial was run to investigate the technology and test its effectiveness before being fully rolled out to all RTGs within the terminal.



person in the safety zone

The Strata project consisted of three different phases.

The first phase was the installation and integration of Strata cameras into our RTGs. The second phase was a data collection period, where the system was learning and being fine-tuned. The third and last phase was full implementation in the field with fine-tuning centred around reduction of false positives and effectiveness.

#### *result*

The introduction of the Strata pedestrian detection system led to an immediate culture and behaviour change among those working around RTGs. This change resulted in a reduction in the number of events being detected and a reduction in the number of near miss incidents being recorded of RTG worker interactions.



#### *conclusion*

The Strata pedestrian detection system has significantly improved the controls in place to prevent workers being fatally run over by RTGs. In addition to this it has also prompted SSA Containers affiliates to take a deeper look into how pedestrian detection systems can be incorporated into plant and equipment to further reduce the risk that plant and equipment present to pedestrians. Strata pedestrian anti-collision camera technology is currently being tested on additional equipment in Southern California such as forklifts.

LINK: <https://www.ssamarine.com/>

