How assistance technologies can give lift truck operators a hand

Help limit the risk of incidents like crashes or tip overs by reinforcing best practices and increasing reaction time

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LIFT TRUCK TECHNOLOGIES

Today's warehouses face constant pressure to do more – fulfilling greater volumes of orders at an increasingly fast pace. Meeting these intense throughput targets depends on lift truck operators performing at their best, day in and day out. As operations work to maximize productivity at every turn, maintaining a strict focus on lift truck best practices and facility-specific traffic rules can be a challenge. In the event errors do happen, businesses risk compromising equipment, facility infrastructure and even the safety of personnel, while accumulating financial costs and unplanned downtime they simply cannot afford.

With so much riding on the performance of lift truck operators, it's imperative to build and support safe, effective habits through proper, comprehensive training.

And just as technology has optimized other aspects of warehouse operation, it can also elevate lift truck operator training, from virtual reality simulators that can supplement OSHA-mandated instruction to modernized training videos and instructional formats that can support engagement and comprehension in adult learners.

But what if you could go a step further, with technology that offers alerts and automated assistance to operators in real time on the warehouse floor? This white paper introduces operator assist systems (OAS), breaking down both advanced capabilities on the warehouse floor and the technologies that power them.
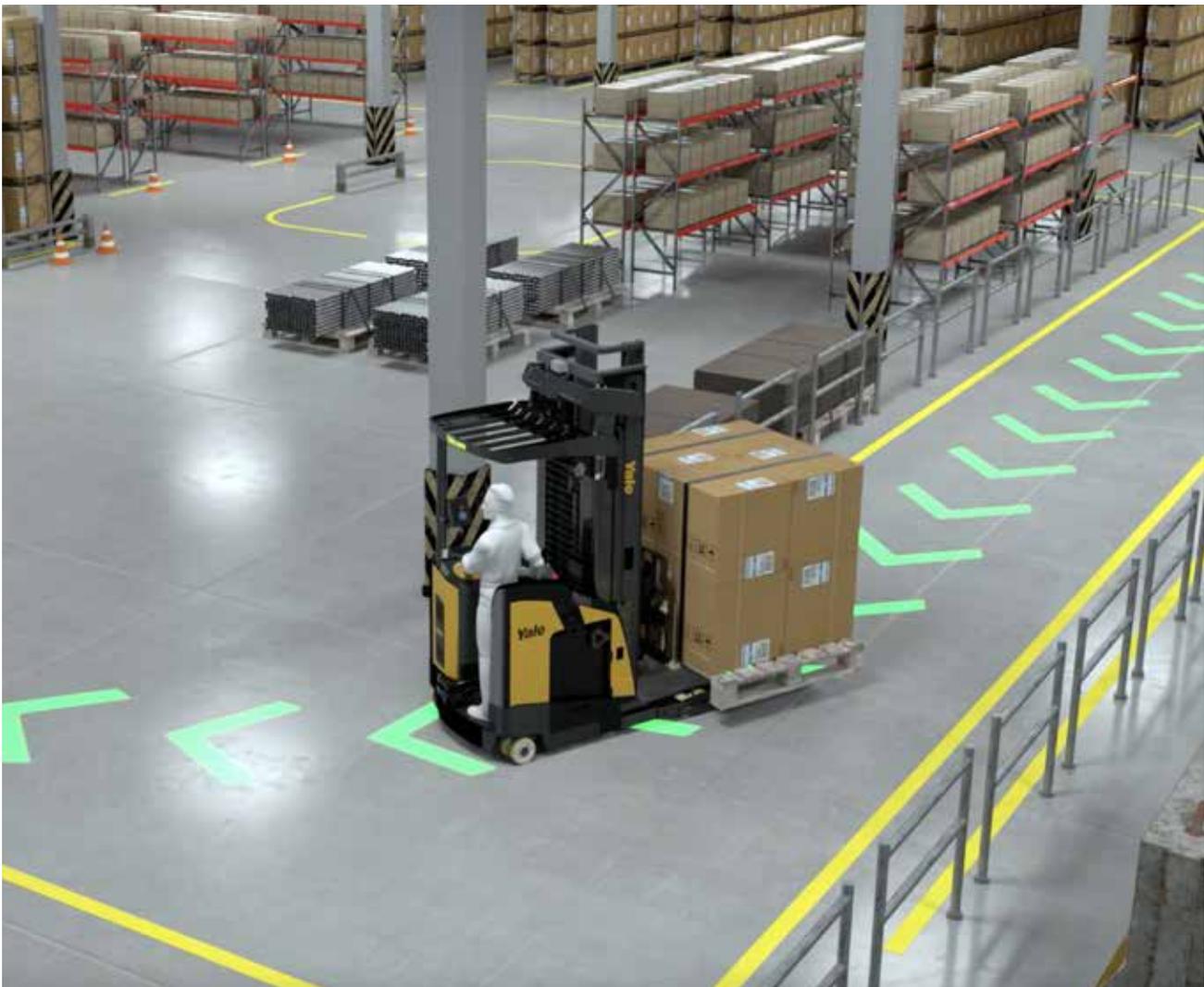
What are operator assist systems (OAS)?

While some may be familiar with systems that consider equipment status or load stability to provide a visual alert or even performance intervention in limited circumstances, a more advanced OAS delivers real value by going several steps further. A solution like Yale Reliant™ also leverages information related to the operating environment, including precise, real-time location and proximity data to enable automatic performance adjustments for a range of scenarios tailored to warehouse operations.

Overload arrest to prevent lifting and carrying loads that exceed weight limits

Adaptive speed controls when cornering or when a load is raised or in unfavorable tilt positions

Exclusion zones to prevent equipment from entering designated areas in the facility

Collision avoidance assist by noticeably reducing the travel speed when obstacles are detected

Line of sight support to help reinforce operator awareness

Location-based fork height restriction to help avoid low-hanging beams or other obstacles

End of aisle slowdown when approaching the end of an aisle or intersection

Speed control zones helps reduce travel speed within designated areas in the facility

The enabling technology suite

Yale Reliant proactively adjusts lift truck performance based on real-time conditions, dynamically adapting speed and fork control to maintain the combined stability of the lift truck and load. Yale Reliant continuously monitors the combined center of gravity of the lift truck and load it carries to apply carefully measured performance adjustments to avoid abrupt shifts or jerks that can upset stability, while keeping the operator in control of the lift truck.

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ADVANCED DYNAMIC STABILITY

Continuously monitors truck and load status to adjust travel speed and smooth forklift and tilt movement to help maintain overall stability and minimize the potential for tip overs. Includes lateral and longitudinal stability, load anti-pitching, lift/lower soft stops, mast lift/lower control, tilt/reach soft stop, and overload arrest.

OBJECT DETECTION (OD)

Two-dimensional LiDAR sensors monitor and detect objects within the line of sight with forks trailing (e.g., sit-down counterbalanced truck travelling in reverse) including trucks, pedestrians, and other objects. Upon detection, the OD system adjusts lift truck performance utilizing advanced traction and hydraulic controls to provide operators with additional time to react.

PROXIMITY DETECTION (PD)

Utilizes ultra-wide band 360° technology to detect tagged equipment, facility areas, and pedestrians within close proximity. Upon detection, the PD system adjusts lift truck performance to provide operators with additional time to react.

REAL-TIME LOCATION SENSING (RTLS)

Utilizes ultra-wide band technology to provide device-to-server connections to communicate with equipped trucks, zones, and pedestrians. Customized location-specific rules can be set to automatically limit lift truck performance when operating in specific areas of the facility.

The user experience

From the perspective of end users, what do alerts and automated performance intervention look like in practice?

In many warehouse settings, employees are accustomed to wearing a lanyard with an access card or ID badge. Wearable electronic tags with proximity sensors look very similar. In the work environment, when pedestrians wearing proximity tags come within a pre-defined distance of a piece of connected equipment, their tag vibrates to help make them aware of the situation. For lift truck operators, the system tracks the distances between their trucks, other connected equipment and tag-wearing pedestrians. If a proximity threshold is breached, operators receive both a visual alert from the truck-mounted OAS display and a performance alert, as the lift truck automatically slows down to provide the operator with clear notice of the issue and with additional reaction time.

While the system limits performance based on real-time equipment status, location and operating conditions, the operator always remains in control of the lift truck. With the truck slow-down functionality, for instance, the system activates automatic speed reduction based on rules specific to certain areas of the facility like ends of aisles or heavy pedestrian zones. The truck speed will proactively slow down to reinforce adherence to location-specific rules, but the operator maintains control of steering and braking to enable the operator to steer away from a hazard or bring the truck to a complete stop.

The system behaves similarly with hydraulic functions such as lift, lower and tilt. When the system senses an attempt to lift a load that is too heavy, truck performance is automatically limited to prevent the operator from attempting to move such a load. The OAS display also informs the operator that exceeding the designated load weight threshold is the cause for performance adjustment. Because of this additional layer of feedback that communicates why the system intervenes, OAS can be a helpful tool to reinforce proper lift truck operation already established during operator training.

TRAINING TOOLS

Lift truck operator training starts with a strong foundational program that fulfills OSHA certification requirements for formal instruction, practical training and operator evaluation. Formal instruction requires classroom training, and modern approaches designed to incorporate adult learning techniques can help support better engagement and comprehension. For example, dividing material into shorter sections broken up with hands-on learning periods helps keep learners engaged to improve comprehension. Likewise, modernized videos with engaging graphics present information in a visual, easy-to-understand format and pace.

While not a replacement for hands-on instruction, virtual reality simulators can allow operators to get additional training exposure in an immersive environment without using actual equipment, preventing interference with regular operations and potential risk of injury or damage to the equipment, product or facility. Virtual reality simulations can even be customized to mimic the particular environment in which trainees will work, complete with racking layouts, aisle widths and more.

A solution for a challenging labor market

According to industry research, best-in-class warehouse operations experience less than 5% annual workforce turnover. But for most, that's far from reality, as industry-wide turnover has averaged over 40% for 5 straight years, and some businesses experience even higher rates.

With such high turnover, businesses are challenged to cope with the revolving door and must prioritize training and constantly reinforce operating best practices. Investing in OAS technology like Yale Reliant can help warehouses get the most out of mission-critical labor resources and keep pace with demand.

To learn more about how Yale Reliant can help reinforce lift truck operating best practices in your operation, reach out to our experts at reliant@yale.com, or schedule a consultation.

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