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# SAFETY FIRST: How to choose the right load movement system for your facility

by Devin Chandler

Safely moving heavy loads in manufacturing, construction, and industrial settings is not a trivial task. These operations often move extremely heavy equipment and materials to complete critical projects. However, the systems used to make these moves can create safety risks that, when things go wrong, can lead to serious injury and even loss of life. There are several types of move systems, including air casters, wheeled and transfer carts, conveyor systems, cranes, and forklifts.

### Consider cranes

Cranes are versatile, capable of lifting multi-ton objects, and popular in a variety of settings, but they also create serious safety dangers. Just recently, in June 2023, four people were injured in a suburb of Mumbai at a construction site when part of a crane broke off. At the beginning of the year, three people died and at least 10 others were injured when a crane collapsed during a temple festival near Tamil Nadu's Chennai. In 2020, a crane collapse in a shipyard

east of Hyderabad killed 11 people.

Thankfully, serious incidents with any type of move system are rare. When they do happen, they can be catastrophic. This is why when choosing a move system, it's critical to understand the safety profile and how difficult or easy it is to operate each move system safely.

### Air casters

Air casters are inflatable bags that float on an ultra-thin film of air, reducing

the friction coefficient and enabling operators to push even very heavy loads with a fraction of the force otherwise required, which reduces ergonomic strain. Air casters lift the load by only a few centimeters, eliminating the risk of the load falling from a height. It's also possible to incorporate power steering mechanisms to ensure total control.

Beyond being safer for human operators, air casters also tend to be safer for facilities. By lifting loads using air, air casters also reduce floor

loading so that multi-ton objects can glide across even delicate floor surfaces (like those with special surface treatments) without risk of cracking or breakage. The safe operation of air casters is straightforward. In most cases, air caster operation requires only a few hours of training to be used safely by existing workers. Altogether, air casters offer a robust safety profile for moving heavy loads.

**Wheeled and transfer carts**

While air casters reduce the amount of force required to push an object, wheeled carts maximize it. In other words, human operators must exercise full muscle power to make most wheeled carts move, which dramatically increases the risk of ergonomic strain. It also increases the risk of collisions and other issues related to momentum. This means the cart can be difficult to stop once the operator gets it moving.

Mechanized transfer carts reduce ergonomic risks, but compromised visibility can still be a risk factor.

Regarding dangers to the facility, wheeled and mechanized transfer carts can put floors at risk by concentrating heavy weights at specific interface points (the wheels) between the load and the floor surface. The safe operation also requires physically fit operators who have been adequately trained to handle these systems. Overall, carts represent a moderate level of safety risk.

**Conveyor systems**

Conveyors move loads efficiently along rollers, wheels, or a belt. They're generally easy to operate and allow operators to control move speed, which can reduce the risk of breakage, injuries, and other issues. The disadvantages of using conveyors are that they create tripping hazards if built into the floor, have numerous moving parts, and a hand or finger can easily catch in the moving parts. Safe operation depends on worker training, smart planning in how the conveyor is integrated into the facility to minimize unnecessary

exposure to risk, and ongoing enforcement of safety policies.

**Cranes**

Cranes lift loads from above and can move loads anywhere within the envelope of the crane's reach. Their safety profile is high-risk, however, especially as safety failures associated with cranes tend to be disastrous. The shackles alone, which have to be big enough to handle large objects, can break fingers, and workers usually can't attach loads without manually hooking them up. As a result, safe operation requires rigorous preparation and adherence to safety regulations. Crane operators must undertake lengthy training courses and earn certification, and all workers in the area must follow strict safety protocols, adhering to local safety laws.

**Forklifts**

Though they represent a very difficult type of move system from cranes, forklifts offer a similarly high-risk





safety profile. Forklifts are wheeled vehicles that lift loads on forks and require extreme care to operate. In the United States, forklifts cause more than a hundred fatalities every year and tens of thousands of injuries. That's because visibility is often compromised, yet the forklifts operate in the same environment as workers, equipment, and other materials. Additionally, loads with an unusual center of gravity or uneven geometry have an increased risk of tipping off a forklift. Like cranes, safe operation depends on using trained and certified drivers along with the enforcement of stringent safety regulations.

**Understanding move safety mitigates risk**

Unfortunately, no move system offers zero risk, but understanding the risks is the first step in mitigating or eliminating them. Here's an example: an operation must move a large and heavy product from one station to the next in a manufacturing facility. The first step is to conduct a thorough assessment of which move systems will work with this application. Often, organizations have more options for moving heavy loads than they may realize. A low-risk option like air casters or a moderate-risk option like a transfer cart might work as well as higher-risk options like cranes.

It is common sense to pick the safer option when weighing equivalent move systems.

Second, it is essential for the organization to ensure it can handle and afford the requirements associated with mitigating safety risks. For example, in the case of cranes, this means paying for certified operators, offering training to relevant workers, purchasing added insurance if required, and taking necessary steps to comply with applicable laws and regulations. Depending on the circumstances, the extra expense and effort might justify switching to a different system. Ultimately, the safety question can sometimes be the final push toward the perfect move system for an organization's needs. **ISR**

**ABOUT THE AUTHOR**



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