PREVENT DROPPED OBJECTS WITH THREE Ts

By Joseph Solheid

Whether a new employee or a 20-year veteran, drops can happen to anyone. Gravity does not discriminate. Just because it has not happened yet is no reason to think it will not happen. In fact, the most serious nuclear threat in U.S. history was the result of a dropped object.

In 1980, an airman performing maintenance on a Titan II missile dropped a single 8-lb wrench socket, which fell more than 70 ft and punched a hole in a fuel tank. This led to an explosion that forced a 9-megaton warhead completely out of the ground, killed a serviceman and injured 20 other people.

The bad news: Dropped objects are the second most common cause of injuries to construction workers (OSHA, 2019). In 2018, 278 fatalities from dropped objects were reported in the U.S., a 15% increase from the previous year (BLS, 2019).

The good news: As of 2018, a national standard exists to distinguish proper tethering solutions, providing formal guidance to help OSH professionals develop effective dropped object safety programs. ANSI/ISEA 121-2018, American National Standard for Dropped Object Prevention Solutions, addresses equipment used to tether or contain hand tools, components, structure and other objects from falling from at-height applications.

To protect employees working at heights, OSH professionals must consider the risk factors that contribute to dropping tools:

- elements (e.g., wind, snow, sea motion);
- body effects (e.g., sweaty or numb hands, fatigue);
- instinctively trying to catch a falling object;
- tool pulling worker down with it if tethered improperly;
- poor housekeeping.

It is all about prevention. Just as personal fall prevention provides the ABCs (anchor, body support, connectors), dropped object prevention involves the three Ts: trapping, tethering and topping.

Trapping

Trapping describes the installation of retrofit attachment points on tools and primary anchoring locations. The majority of tools do not come with them built in. Anchor attachments should be installed onto locations that are secure and are never intended for heavier tools if applied to a person.

Tethering

Often using lanyards, tethering is retention of tools and equipment being used to attach to the anchor points that hold them.

Topping

Topping refers to the containers that workers use to bring tools and equipment to and from heights. Regardless of type or mode of transportation, these containers should have a secure closure or top that can cover contents and prevent them from spilling if tipped. Tool pouches and bags are typically carried on individuals to keep the contents at hand while working. These often remain stationary. Hoist buckets and bags are transferred by different means, typically by lifting them in a portable fashion to and from heights.

Controls

ANSI/ISEA 121-2018 covers four active controls or tethering and container solutions that workers actively employ to mitigate dropped object hazards. The scope includes:

- anchor attachments: retrofit attachment points installed onto fixed anchor locations;
- tool attachments: retrofit attachment points installed onto tools and equipment;
- tool tethering: lanyards that connect tools to an anchor point;
- containers: bags, buckets and pouches that are used to transport tools and equipment around work zones.

The standard was crafted based on input from major product manufacturers, including competitors that recognized the need to work together to bring consistency and clarity to the market. Not included in this new measure are preventive solutions such as netting and toe boards.

Conclusion

As a first-of-its-kind standard, it will take time for the impact to ripple to the marketplace, but many of the requirements are already being met by leading manufacturers. Businesses with employees who work at heights need to keep the Three Ts in mind. Trapping, tethering and topping can prevent work stoppages and save lives. **PSJ**

References

Bureau of Labor Statistics (BLS). (2019, Dec. 17). National census of fatal occupational injuries in 2018 (News release). Retrieved from www.bls.gov/news.release/archives/cfoi_12172019.htm

OSHA. (2019). Commonly used statistics. Retrieved from www.osha.gov/data/commonstats

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Math Toolbox, continued from pp. 52-56

Answers: The Case of the Overfilled Tower

You Do the Math

Your answers may vary slightly due to rounding.

1a) $p = 74 - 33 = 41\ psi$

1b) $p = 41 \cdot 144 = 5{,}904\ psf$

1c) $h_p = \frac{p}{w} = \frac{5{,}904}{40.13} = 147.12\ ft$

2a) $p = 8.3 - 0 = 8.3\ psi$

2b) $p = 8.3 \cdot 144 = 1{,}195.2\ psf$

2c) $h_p = \frac{p}{w} = \frac{1{,}195.2}{62.38} = 19.16\ ft$

How Much Have I Learned?

Your answers may vary slightly due to rounding.

3a) $p = 63 - 21 = 42\ psi$

3b) $p = 42 \cdot 144 = 6{,}048\ psf$

3c) $h_p = \frac{p}{w} = \frac{6{,}048}{34.32} = 176.22\ ft$

4a) $p = 15 - 8 = 7\ psi$

4b) $p = 7 \cdot 144 = 1{,}008\ psf$

4c) $h_p = \frac{p}{w} = \frac{1{,}008}{43.89} = 22.97\ ft$

The Language of Hydrostatic Pressure

5) f; 6) h; 7) b; 8) e; 9) a; 10) i; 11) c; 12) g; 13) d.

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