



WARREN

It's a Long Way Down

An Improperly Designed Personnel Lift Results in a Tragic Accident

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A seventeen-year-old boy and his parents arrive at a Bungee Jumping entertainment facility and pay for the boy to perform a jump. A harness is strapped to the boy's legs and attached to one end of the bungee rope. He gets into a "personnel lift" cage with a nineteen-year-old jumpmaster, and a winch and cable are used to raise the cage to the top of the arch.

An accident occurs when the cage is raised too high by the winch and is stopped by wire rope clips at the top of the cage jamming between the top pulley and the structure. The winch continues to rotate and pulls the single 3/8 in. wire rope in two. Since there are no safeties, the cage falls 150 ft. to the ground. The two boys are killed as a result of the incident.

Standards Violated

ANSI A10.4 entitled "Safety Requirements for Personnel Hoists and Employee Elevators for Construction and Demolition Operations" requires:

- Two ½ in. diameter cables (One 3/8 in. diameter cable was installed.)
- 11 in. diameter sheaves (Two 2.75/ in. and one 6 in. were installed. Bending of the wire rope over the small diameter sheaves reduced the capacity of the cable below the hoist pulling capacity.)
- A terminal stopping device, which would limit the cage travel by shutting off the hoist motor when the cage reaches the top of its travel (No terminal stopping device was installed.)
- An emergency stop switch inside the cage to allow the persons being lifted to shut off the hoist motor (No emergency stop switch was inside the cage.)
- Safeties to stop the cage from falling if the cable breaks (There were no safeties to stop the cage.)

None of the above safety code requirements were met.

Conclusions

Lifting personnel is serious business. Improperly designed or constructed personnel lifts can lead to severe accidents. Codes and standards should be consulted and followed anytime personnel are going to be lifted. For more information on lifting personnel safely or to discuss an accident involving personnel lifts, contact Jeffery H. Warren, Ph.D., P.E., CSP.