

# ES&H UPDATE

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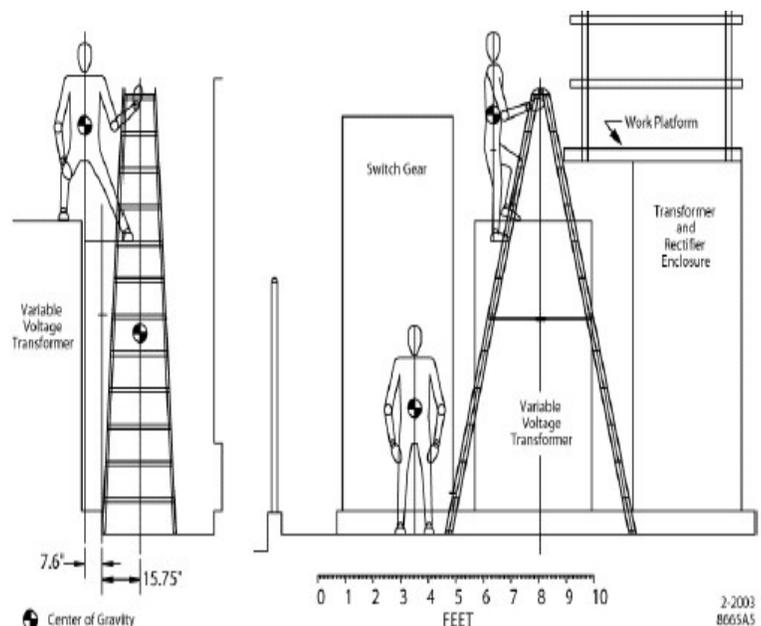
## Ladder Safety

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On January 28, 2003, an employee at the Stanford Linear Accelerator Center (SLAC) fell from a ladder and sustained head injuries. The employee was hospitalized for more than five days. As a result DOE conducted a Type-B Accident Investigation. The employee is expected to make a full recovery.

The SLAC incident involved a systems engineer climbing a 12-foot tall fiberglass "Two-step" stepladder (The ladder had steps up both sides of the ladder). The employee was climbing the ladder to access the top of a variable voltage transformer. From that location he was planning on stepping up to a work platform atop another transformer to inspect for leaks. The investigation concluded that as the Systems Engineer stepped from the ladder, the horizontal force exerted was sufficient to tip the ladder.



*The employee fell approximately 10 feet, striking his head on the equipment and/or the ground.*

Similar exposures are present at Fermilab. In September 2001, an employee was standing on a ladder holding a flashlight for a co-worker who was standing on an elevated work platform. As he turned to go down the ladder, the base began to slip. The worker rode the ladder to the ground, a distance of about 6 feet. The employee suffered a fractured elbow, wrist, and cheekbone; and received 6 sutures in his elbow. Investigation revealed the ladder was not tied off or secured in any manner, did not have any rubber feet (because it was only the top half of an extension ladder), and was set-up on a smooth steel floor plate. A stepladder was usually used to access that work platform, but was unavailable. In addition, it turned out that the stepladder normally used was too short to safely access the platform. Alternatives had been discussed, but no action had been taken before the incident occurred.

Two very important findings arose during the DOE investigation at SLAC that have application at Fermilab. The first was the poor level of planning for the job. The employee was going to be working at heights. There was no fall protection planned. The ladder chosen was inappropriate for the job. His supervisor was not aware he was going to be doing this activity. At Fermilab, FESHM 2060 recommends a written hazard analysis when working at heights, i.e., wherever the fall potential is greater than 6 feet.

The second contributing cause was the poor condition of the ladder used in the incident at SLAC. There was damage to a rung, cracks in one side rail, and two of the non-slip feet were damaged. In other words, the ladder should have been taken out of service and not used.

The following is what we tell our subcontractors about ladders every day in Subcontractor Orientation. This should be remembered and practiced by all of us:

- ✓ Never use a defective ladder.
- ✓ Before use, visually inspect your ladder for obvious defects such as cracked or damaged side rails; missing, loose or cracked rungs, loose, bent, or broken steps or spreaders; and worn or missing feet.



- ✓ Select the right ladder for the job (*Example: A straight ladder long enough to reach the work platform should have been used at SLAC*).
- ✓ Work no more than an arm's length from the upright position (*Example: The Systems Engineer at SLAC had to step up and over at least 23" to reach the top of the variable voltage transformer*).
- ✓ Straight ladders must extend at least 3 feet above the highest landing to which access is intended.
- ✓ Climb no higher than the third rung from the top of a straight ladder, or the second step from the top of a step ladder.
- ✓ Only one person on a ladder at a time.
- ✓ Select firm footing. Place the feet of a straight ladder at least 1 foot from the vertical plane for each 4 feet of height between the base and support.
- ✓ Do not climb or stand on improvised ladders such as chairs, barrels, drums, desks, or boxes.

This message should be distributed to all employees via delivery of un-addressed copies to Fermilab mail stations. Suggestions for ES&H message topics should be directed to Mary Logue at [grace@fnal.gov](mailto:grace@fnal.gov) or X6329.