

Sophisticated Systems Signal New Mishap Prevention Need

Washers tilt, shuttles carry goods, dryers load and unload...all by themselves. It's better than the equivalent manual labor from an injury prevention standpoint. Or is it?

Based on a position paper by the IIL Safety Awareness Task Force

Automated and semi-automated laundry systems have completely or partially eliminated human labor in the laundry. The result is a radically lower number of employees exposed to moving equipment and potential accidents.

But that exposure remains significant.

There are still plenty of employees working on a daily basis in wash aisles. Other workers might—even must—occasionally become involved in the area. For everyone's sake, safety issues can't be put on the back burner, although the laundry's systems may be automated.

In fact, a safe environment around automation is even more critical to prevent:

- Employees from being lulled by smart machines into thinking there's no danger
- Management and equipment manufacturers from falling so much in love with speed and automation that employee safety becomes secondary

The responsibility of making sure that every person goes home with 10 fingers and 10 toes each day can't be overstated. If it's not your first priority, there are a lot of lawyers out there who will try to be sure it is!

Once you're sure you've done everything possible to assure a safe environment—through the creation of employee safety programs and smart but safe systems—you can get down to your second priority: production.

Semi-Automated Systems

Partially automated washlines are the most common type of automation in in-

dustrial plants today. These systems rely on manual involvement, using automation to speed turnaround and production as well as reduce fatigue. The latter is a clear safety advantage because it helps prevent accidents. Employees can still be productive late in the day and stay sharper than they would be from more arduous work.

An example of a partially automated system:

- Bank of tilting washer-extractors, which the employee tilts rearward to load from overhead slings
- Shuttle conveyor, onto which the employee dumps goods from forward-tilting washer-extractors
- Self-loading and unloading dryers, loaded by the shuttle conveyor and automatically unloading onto any number of conveyor or sling systems

Since this scenario involves employees—and devices that rotate and move up, down, and sideways—there are a number of hazards, all preventable:

Wash aisle access. First is the potential for anyone in the laundry, other than employees whose job is to be there, to gain access to the area. This can be addressed by a railing meeting OSHA standards that keeps unauthorized personnel from the semi-automated work area (see insert). Signs warning of specific dangers should be clearly posted.



How doors open. Automatically opening doors are a clear hazard to employees in a partially automated system: They can crush employees' hands or bash their bodies. The better alternative is the manually opening door. It takes only seconds to operate; the employee merely operates the controls and the door opens without effort. The time involved is a very small price to pay for the added degree of safety.

Conveyors in motion. Automatically moving conveyors can strike an employee; or an employee can strike some-



one else while moving a manually operated conveyor.

Avoid washer-extractors that automatically call for a shuttle. The only safe system is one in which the employee is responsible for moving the shuttle. Also, the shuttle should:

Be driven by the operator, not merely summoned. Analogy: Today's high-speed light rail transportation systems. They're equipped with computers and sensors that enable them to drive themselves. But you always need an operator on board to stop the train if there's a pedestrian on the track.

Have a 31-inch minimum aisle between the shuttle and washer-extractors. Otherwise, anyone else loading a washer-extractor from the front will literally have no place to go and will be crushed by the front of the conveyor.

Have specifically designed kick plates. Located on either side of the conveyor, they cause the shuttle to automatically stop if the shuttle comes into contact with any object as it moves from side to side.

Have other critical safety devices. These include both visible and audible warnings that the shuttle is moving: a flashing beacon and a loud beep.

Cylinder rotation. Rotating cylinders can entrap or sever an employee's hands or arms when attempting to pull goods from a washer-extractor. A two-hand safety control is imperative to prevent an operator from trying to "help" the unloading process by pulling at the goods while the cylinder turns.

The result can be fatal—documented cases prove this point. With a two-hand operation, both hands are engaged, and the cylinder automatically stops turning if the employee removes either hand while jogging the cylinder.

Tilting. Similarly, a two-handed control for tilting the machine prevents operators from crushing their hands or arms while lowering or raising the machine.

A further precaution is essential for maintenance employees who may be required to work under the machine while it's in its tilt-back position. Specially designed safety supports (provided by the manufacturer) should be available and easily accessible so they're used when maintenance is performed (see safety instructions insert).

Failure to stop on command. Events

Moving Machinery Safeguarding—OSHA Safety Standards

RAILING

It is essential that walkways or work areas adjacent to dangerous equipment be guarded to protect workers with standard railing.

- A standard railing is required consisting of a top rail, intermediate rail, and posts, and required to have a vertical height of 42" nominal from upper surface up top rail to floor. The top rail is required to be smooth surfaced throughout the length of the railing. The intermediate rail is required to be approximately half way between the top rail and the floor. The ends of the rail are required not to overhang the terminal post except where such overhang does not constitute a projection hazard.
- For pipe railings, posts and top and intermediate railings are required to be at least 1-1/2" nominal diameter with posts spaced not more than 8 ft. on centers.
- For structural steel railings, posts and top and intermediate rails are required to be of 2"x2"x3/8" angles or other metal shapes of equivalent bending strength with posts space not more than 8 ft. on centers.
- The anchoring of post and framing of members for railings of all types are required to be of such construction that the completed structure shall be capable of withstanding a load of at least 200 lbs. applied in any direction at any point on the top rail.
- All hand rails are required to provide a clearance of not less than 3" between the hand rail and any other object.
- Gates installed in the perimeter guardrail system which allow operators to enter the point of operation danger area should incorporate safety interlocks and/or presence sensing devices to interrupt mechanical operation .

CONTACT PREVENTION GUARDING

Safeguards at the point of operation are essential for protecting workers. Where the operation of a machine or accidental contact can cause injury to an operator, the hazard must be controlled.

- Safeguards are required to be so designed to prevent the operator from reaching or extending through, over, under, or around the guard into the danger area during the operating cycle.

WARNING SIGNS

Warning signs provide an operator with an indication that special precautions are necessary for an extra margin of safety.

- Danger signs are required to be installed to warn of specific dangers.
- Caution signs are required to be installed to warn against potential hazards or caution against unsafe practices.

TRAINING

Even the most elaborate safeguarding system cannot offer effective protection unless the worker knows how to use it and why. Specific and detailed training is therefore a crucial part of any effort to provide safeguarding against machine-related hazards. Thorough operator training should involve instruction or hands-on training in the following:

- A description and identification of the hazards associated with particular machines.
- The safeguards themselves, how they provide protection, and the hazards for which they are intended.
- How to use the safeguards and why.
- How and under what circumstances safeguards can be removed, and by whom (in most cases, repair or maintenance personnel only) .
- What to do (e.g., contact the supervisor) if a safeguard is damaged, missing, or unable to provide adequate protection.

This kind of safety training is necessary for new operators and maintenance or setup personnel, when any new or altered safeguards are put in service, or when workers are assigned to a new machine operation.

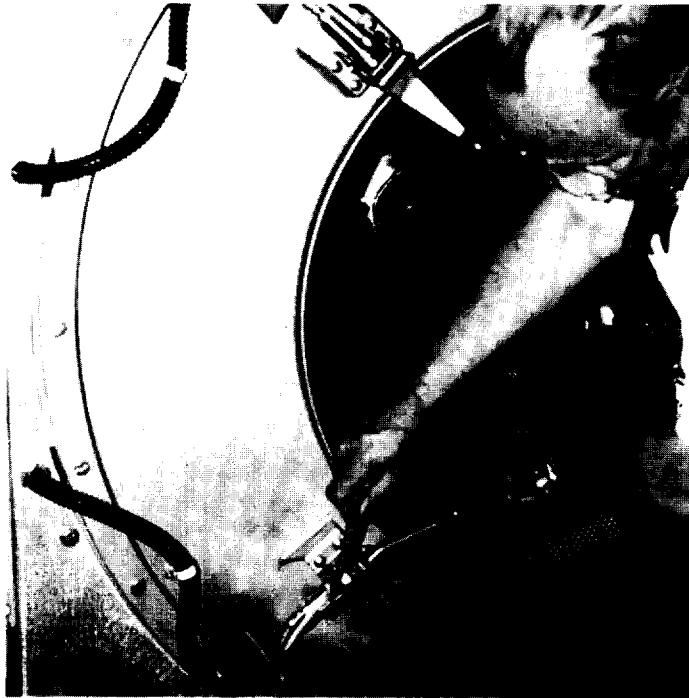
In machine safeguarding, as in other regulated areas of the American workplace, to a certain extent OSHA standards govern function and practice. Because practical solutions to moving machinery parts problems are as numerous as the people working on them, no publication could keep pace with standards of these solutions or attempt to depict them all. Whether or not a proper safeguard has been warranted for a particular application, no mechanical motion that threatens a worker's safety should be left without a safeguard.

can cause equipment to move unexpectedly and continue operating despite the

command to stop. Thus, any safety control, whether it involves door opening,



SAFETY



Washer-extractor interlock device.

tilting, or other movement, must be external to the microprocessor. Then, the machine is incapable of this movement without the manual command of the safety control.

Fully Automated Systems

Continuous batch washing systems will become more prominent in industrial plants in coming years, particularly as systems continue to evolve and are specifically geared to the types of goods in these plants.

With these systems, no human involvement is needed once goods are loaded into the system—until goods exit from the dryer. Automation can also be used at this point, through conveyor or sling systems that transport goods to the appropriate finishing area.

Here, the critical factor is: No one should be in this area while the system is operating.

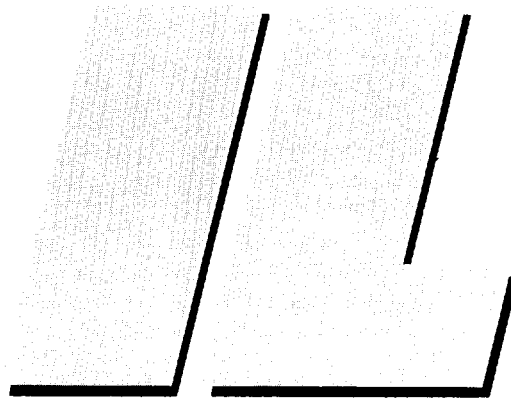
To insure this, the protective railing system should provide an extra precaution: a circuit interface that automatically shuts down the system should anyone enter the area.

All of these recommendations may translate to higher equipment costs. If they do, it's a small price to pay instead of the high human and economic costs of a marginally safe wash-room. □

Sample from a Washer-Extractor Manual—

General Safety Requirements: Maintenance Section

Inspect and service washer-extractor in accordance with norms of good practice and with preventive maintenance schedule. Replace belts, pulleys, brake shoes, clutch plates/tires, rollers, seals, alignment guides, etc. before they are severely worn. **Immediately investigate any evidence of impending failure and make appropriate repairs. (Examples: cylinder, shell or frame cracks, drive components such as motors, gear boxes, bearings, etc. whining, grinding, smoking, or becoming abnormally hot; bending or cracking of cylinder, shell frame, etc.; leaking seals, hoses, valves, etc.)** Contact your dealer or service department for assistance. **Do not permit servicing by unqualified personnel.**



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