Maintaining the Emergency Standard

By Rebecca Geissler

Specifying and installing the right equipment "in case" of an emergency is simply not enough. Many facilities have emergency showers and eyewash fixtures to comply with requirements, yet few adhere to a maintenance schedule or regularly train employees on how to use the equipment. This is akin to having smoke detectors in your home but never putting in new batteries to be sure they will work if needed or to having a fire extinguisher but not showing anyone in the house where it is or how to use it.

When designing and implementing an emergency plan, routine testing and maintenance are often overlooked. If emergency fixtures are left unused for long periods, sedimentation, and even rust, can build up in the pipes. This can result in further harm to the user or can even cause the equipment not to function at all. Flushing stagnant water also reduces the risk of microbial hazards.

Photo courtesy of Bradley Corp.

A heavy-duty tester provides a convenient way of testing drench showers to comply with ANSI specifications for weekly testing – without getting wet. The watertight funnel has a weighted bottom and directs water to a drain or bucket.

In an emergency, every second counts, especially when a user's vision is at risk. The last thing anyone should be doing is searching for a usable eyewash station or drench shower.

Evaluate Job Sites

The good news is that this worst-case scenario is preventable, even though the initial accident was not. The first step is to weigh the risks and evaluate the various job-site locations. New hazards may have been introduced since the equipment was first installed. For example, a work site with chemicals or gases that could contaminate a large area of the body, and where there was previously a stand-alone eyewash unit, may now require a combination drench shower and eyewash unit.

Keep in mind that the American National Standards Institute (ANSI) Z358.1 emergency equipment standard requires that fixtures be installed within 10 seconds of each hazard, without any obstructions. Based on average walking speed, this is about 55 feet. If strong acids or caustics are a hazard, the equipment should be placed immediately adjacent to where the exposure could occur.

Be sure to remove any boxes or other objects that may be blocking the emergency station and check that fixtures are easily identified. If emergency equipment is used infrequently, the area surrounding it may become cluttered, or it may be used as extra storage space. These obstructions can prohibit workers from getting to the equipment quickly. In some situations, workers may not even be aware that the fixtures exist.

The ANSI standard mandates that areas containing emergency fixtures be well lighted and that each fixture has a highly visible sign for quick identification. Choosing fixtures with a yellow safety coating also ensures that they will be easy to locate in an emergency. In addition, employees should be trained on how to deal with the different hazardous situations present at the job site and on how to get injured workers to the equipment. Do not assume they will know, for example, that a worker splashed with chemicals should remove his or her shirt or that body or eye areas should be flushed for a full 15 minutes.

Testing 1-2-3

Employee training and proper testing will give you and business owners or management peace of mind, knowing that emergency equipment is in good working order. Testing also ensures that plumbing systems can support all of the drench showers or eyewash units and that they will not malfunction when needed.

If someone besides you will perform the testing after the initial installation, walk through the testing procedures and provide him or her with the necessary information to maintain a testing program. Since the Occupational Safety & Health

Administration (OSHA) defers to the ANSI standard on these matters, it is important to keep written documentation for any testing and inspections done.

The ANSI standard provides instructions for testing each type of equipment to verify proper performance on a weekly and an annual basis. ANSI requires that plumbed units be activated on a *weekly basis*, which will accomplish the following:

1. Verify that water is being supplied to the unit.
2. Flush out any sediment or rust that may have built up in the system.
3. Minimize the possibility of microbial contamination due to sitting water in the system.
4. Keep the plumbing system lubricated and ready for use in an emergency.
5. Provide an opportunity for a quick visual inspection of the equipment.

There are a number of other specific benefits to running water through the system on a weekly basis. Flushing pipes keeps gaskets and o-rings from drying out and cracking, which can result in leaking. Fresh water moving through the drain traps keeps sewer gases from flowing back through the pipes. Sometimes the eyewash fixture and drench shower have separate waste traps, each of which should be flushed.

Flushing is also a way to check for other potential concerns, such as having adequate drainage. If standing water is pooling under the showers, or worse, flowing into other work areas, this is a problem that needs to be addressed before the showers are used for a full flush in an emergency. Plans should be made to accommodate the significant volume of wastewater from showers.

To conduct the weekly test, turn on the incoming water supply and close the valve. Visually inspect pipes and the floor around the unit for any leaks. Then reopen the valve; it should remain open without the user needing to touch the unit to keep the flow going. Finally, remember to log your testing and inspections.

Testing for portable self-contained equipment is slightly different but should also be conducted according to ANSI guidelines, along with the manufacturer's instructions. Portable units need not be activated weekly. Instead, they should be visually inspected to determine if flushing fluid needs to be changed per the manufacturer's instructions. Also check bottle eyewash stations and replace any bottles that have been opened; they are no longer sterile and should not be used.

Annual Testing and Maintenance

In addition to weekly testing, ANSI also requires that plumbed drench showers and eyewashes be given a more comprehensive testing on an annual basis. It is best if a safety inspector or member of the facility staff not involved with the weekly testing conduct the annual inspections. This way a

fresh set of eyes can look for any potential problems. There should not be any surprises.

A few tools should be kept on hand for these annual inspections (and more rigorous weekly testing, if possible): an eyewash testing gauge, a tape measure, a thermometer, a shower tester with a bucket, and a watch with a second hand. Here are a few key things to monitor:

Watch the clock to make sure the proper flow rate and velocity are maintained. A minimum water pressure of 30 pounds per square inch (psi) should be supplied to the unit. The supply must also satisfy the ANSI minimum flow standard, which is typically at least 20 gallons per minute (gpm) for drench showers, 0.4 gpm for eyewashes and 3.0 gpm for eye/face washes. Actual flow rates will vary by product, so consult with the equipment manufacturer to verify flow rates. Supply to the unit must be sufficient to support a full 15-minute flow of flushing fluid.

Photo courtesy of Bradley Corp.

Emergency fixtures should be accessible within 10 seconds of hazardous workstations. ANSI requires both weekly and annual testing to ensure that all units are functioning properly in case of an emergency.

Be sure the unit activates in one second or less. The valve should open automatically and stay open until manually turned off.

Check tepid water temperature with a thermometer. ANSI specifies that the system must deliver a 15-minute flow of "tepid" water to all drench showers and eyewashes at the same time. As a general rule, 100°F is the highest water temperature and 60°F is the lowest. Chemical burns can intensify above this range and hypothermia is a possibility at the other extreme.

Measure the spray pattern and fixture height. Drench showers must have a spray pattern with a diameter of at least 50.8 cm at a height of 152.4 cm from the floor. The center of the pattern should be at least 40.6 cm from any obstructions. A test gauge is used to determine whether an eyewash or eye/face wash unit meets the flow pattern requirements for flushing the eyes. The simplest way to verify an eyewash spray pattern is to use a test gauge that can be obtained from the equipment manufacturer. The dimensions used for the gauge and the procedure for measuring the pattern is set by the ANSI standard.

Visually inspect all components. Look for leaking or corrosion on the pipes of plumbed fixtures. Be sure dust caps, identification signs, push handles or bowls are not missing or broken. Check for external damage such as denting or scratches on corrosion-resistant finishes. Tighten any plumbing connections, as needed.

Fully document the inspection. As you go through the inspection process, note any deviations from the requirements of the ANSI standard and how they were addressed. Also note any repairs or replacements done on the equipment. This documentation is a record that a full annual inspection was completed, and will also highlight any areas of potential concern that should be closely monitored during future inspections.

Although high-quality emergency fixtures should not require frequent repairs or replacement, small items like dust caps may need to be replaced often. Occasionally, an accident with a forklift or other machinery may require replacement of a handle or eyewash bowl. It is important to use only parts supplied by the original manufacturer for this type of product. If substitute parts are used, the unit is no longer certified to be ANSI compliant.

Getting into the Flow

The best way to avoid any problems with emergency fixtures is with ongoing testing and maintenance. Consult your equipment manufacturers to learn more about evaluating job sites, and ask safety professionals about any questions you may have with regard to best practices for testing equipment. The most important thing is to get into the habit of getting the systems flowing. ■

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