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EH&S Fact Sheet

Environment, Health and Safety Information for the Berkeley Campus

TRITIUM SELF-ILLUMINATING EXIT SIGNS

Exit signs are important to safety

We should all know where to go in the event of an emergency, (see Fact Sheet No. 34, *Building Evacuation Signs*) but if we don't, we can expect a clearly visible EXIT sign to show us the way out of a building. Exit signs are required by the California Building Code and each facility manager or building coordinator is responsible to ensure the exit signs can perform their intended function 24 hours a day, seven days a week. EH&S reviews building plans to confirm compliance with the building code and periodically inspects campus buildings to confirm the signs are operable and in place.

They come in different forms

Exit signs come in a wide variety of types but they must be clearly illuminated, at all times, even in the event of a power failure. This can be accomplished with building emergency power, battery packs, photo-luminescence, electro-luminescence, or a radioactive isotope of hydrogen gas, called tritium. Tritium exit signs can be useful because they require no electrical power or maintenance for many years; however, there are other costs associated with additional controls required by the California Department of Public Health (CDPH) regulations and disposal criterion. There are also safety and financial risks should a tritium exit sign be mishandled.

Tritium exit signs

Tritium is a radioactive gas found in nature that can also be produced in a nuclear reaction. It emits ionizing radiation (low energy beta particles) that can produce light by interaction with a phosphor on the inside of the glass tubing of an exit sign. The tritium will lose half of its energy in about twelve years resulting in a significant decrease in the light output from the exit sign. The manufacturer will specify how long a specific model of tritium exit sign may be used before it must be replaced.

Tritium exit signs require additional controls

Although tritium exit signs were historically allowed to be installed in some campus buildings, they may now be installed only with written approval of both the Campus Fire Marshal and the Campus Radiation Safety Officer. EH&S will also provide written criteria that must be met by the person responsible for the signs to ensure the signs are controlled and only disposed of to a licensed recipient. In addition, persons installing and removing exit signs containing tritium must be instructed in radiological safety precautions necessary to minimize their exposure in the event the glass tubes are broken.

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Emergency Response

Tritium emits a low energy radioactive beta particle that can only result in radiation exposure if the glass tube in the exit sign is broken. When a tritium exit sign is damaged and the sealed glass tube is broken, you should:

- Leave the sign alone; don't touch it.
- Evacuate the area immediately.
- Isolate the area; don't allow entry.
- Ventilate the area to the outside.
- Notify EH&S at 642-3073 or via UCPD during off-hours.
- Identify all individuals possibly exposed.
- If you think you may have been contaminated, you should:
    - Shower with soap and water (at least wash your face and hands).
    - Change clothing and put the potentially contaminated clothes in a plastic bag for testing to confirm exposure.
    - Drink plenty of fluids to help the tritium leave the body more quickly.
    - Collect a urine sample for testing to rule out internal exposure.

Disposal

Tritium exit signs cannot be disposed of in the ordinary trash or given to another individual not specifically licensed by the CDPH or Nuclear Regulatory Commission. In addition tritium exit signs cost about $100 per sign for the University to dispose of. Contact EH&S if you plan to remove or dispose of a tritium exit sign. Specific guidance is provided in Section K-Radioactive Waste of the Radiation Safety Logbook, located on the EH&S webpage.

Reporting

You must immediately report stolen, lost, or damaged tritium exit signs to the Campus Radiation Safety Officer at 642-3073.

Policy

In 2001 the University of California, Berkeley Radiation Safety Committee adopted the following policy for use of tritium exit signs:

- Tritium exit signs must not be installed without written approval of the Campus Fire Marshal and Campus Radiation Safety Officer.
- Exit signs requiring replacement must not be replaced with tritium exit signs.
- Tritium exit signs must not be abandoned or disposed of as ordinary waste.
- Radiation warning labels and labels identifying the sign as containing radioactive material must not be removed from the sign.
- Departments with tritium exit signs must immediately notify EH&S if any tritium exit sign is damaged, missing, tampered with, lost, or stolen.
- Tritium exit signs must not be dismantled.

Tritium exit sign responsibilities

EH&S will:

- Verify new construction and facility renovations do not rely on tritium exit signs,
- Provide guidance on radiological safety, inventory control, purchasing, and disposal criteria,
- Review and approve requisitions for new or replacement tritium exit signs,
- Periodically verify the inventory of tritium exit signs,
- Package and ship tritium exit signs for disposal,
- Investigate mishandling, lost or stolen tritium exit signs, and
- Make reports to CDPH.

Campus construction, renovation and maintenance groups will:

- Justify requests for all new tritium exit signs,
- Fund purchase of all new signs and disposal of all tritium signs,
- Inventory and inspect all signs at least annually, and

Building Coordinators will:

- Report all instances of mishandling, loss, breakage, and theft immediately to EH&S.
- Report low lighting and replacement needs to EH&S, as well as their maintenance group.

Contact

If you have questions contact the Radiation Safety Officer or Fire Marshal at 642-3073.