



Planning and Development Department  
Toxics Management Division

CONSENT CALENDAR  
March 21, 2006

To: Honorable Mayor and  
Members of the City Council

From: Community Environmental Advisory Commission

Submitted by: Robert Clear, Chair, Community Environmental Advisory Commission

Subject: Phase-Out of Tritium Exit Signs for the City of Berkeley

RECOMMENDATION

Adopt a Resolution requiring the City Manager to institute the following policy: 1) no new tritium signs to be purchased or installed in new City-owned and leased buildings; 2) the City must provide an inventory of all tritium exit signs in City owned and leased buildings within six months; and 3) the City should provide facilities maintenance staff and subcontractors the training to recognize such signs and properly remove and legally dispose of them at the end of their useful life or when broken.

FISCAL IMPACTS OF RECOMMENDATION

Unknown but not significant since alternatives exist. The inventory and adding tritium exit signs to the Finance Department list of banned products is the extent of the time commitment.

CURRENT SITUATION AND ITS EFFECTS

During the past four years, the CEAC has requested from the City and from Berkeley Unified School District an accounting of all tritium exit signs in their facilities. Neither BUSD nor the City had knowledge of such signs. BUSD reported that they had none but that was later found to be inaccurate. Without knowledge of the existence of tritium exit signs, it is unlikely that they will be managed according to the law. Tritium exit signs can break and it is conceivable, though unlikely, that such breakage can lead to significant health impacts. More significant is the potential clean up costs and liabilities that can result from such a sign being broken indoors.

BACKGROUND

Tritium exit signs are commonly installed in new construction where providing electric power is difficult or inconvenient. Each exit sign contains 10 to 15 curies of tritium, which is the radioactive isotope of hydrogen. The tritium is enclosed in little glass vials, which are coated with phosphorescent powder. The tritium emits low energy electrons, which stimulate the phosphor to emit light.

The tritium has a half-life of 12.5 years, so the exit signs have to be replaced approximately every 10 years, in order to maintain sufficient brightness to provide safe guidance for an emergency exit. Because the signs contain radioactive tritium, they are regulated by the United States Nuclear Regulatory Commission (NRC), which stipulates such signs have to be returned to the manufacturer

and not disposed as solid waste. If a sign is stolen, the owner is required to notify the NRC or the appropriate state agency, and in California, that is the Department of Health Services (Cal DHS). Most property managers do not know the requirements of the NRC or Cal DHS because these codes are not implemented and only if an illegal disposal comes to the national headlines do regulatory agencies take any interest. One example was the celebrated tampering of 3 such signs by a Union New Jersey boy in 1997. This incident caused the contamination of a home and its residents with a clean up that ran over \$200,000<sup>1</sup>.

The electrons from the tritium decay cannot penetrate glass, or even skin, and so the tritium exit signs are completely safe, as long as they remain intact. Tritium is a hazard if it is inhaled or absorbed into the body. Tritium can exist as a gas or as tritiated water. It is the latter form that can linger in the body for long periods causing damage to cell structure from within. Inhalation of tritium gas is not considered as a significant risk.

The radiation dose from complete release of the tritium from a tritium exit sign would not be sufficient to cause acute radiation poisoning, but it is possible that under some circumstances it could exceed the EPA annual recommended dose levels for the general public. This would cause a small increased risk of cancer to the exposed population. In addition to the problems associated with immediate release, there is a possibility of problems from contamination.

If these clean-up costs are not covered under an insurance policy, they may be a significant cost to the city.

On October 6<sup>th</sup>, 2005, the CEAC took the following action: Motioned, seconded, carried (Clear/Harris. For: Toffel, Hale, Moret, Harris, Clear. Against None. Abstain: None. Absent: MacKusick, Issel, Wood.)

- 1) City to create an inventory of all tritium exit signs in city-owned and leased buildings by June 1, 2006.
- 2) City to institute a policy of no purchases or installation of tritium signs.
- 3) City to provide all facility maintenance hires and subcontracts with information to aid them to identify tritium signs and inform them of their responsibilities with regards to them (see #3 below)
- 4) The appropriate city agencies are to develop policies to institute the following guidelines:
  - a) Signs are to be removed in an intact state prior to demolition, or remodeling. Signs removed during normal replacement are also to be removed intact. Removed signs are to be returned to the manufacturer or other appropriate agency.
  - b) Identify the appropriate agency, if any, for notification of theft of signs. Prompt notification of the appropriate agency upon discovery of theft.
  - c) Safe procedure for prompt clean up and proper disposal of any broken signs and associated contaminated clean up material.
- 5) The City should disseminate this policy to Berkeley Unified School District (BUSD), Association of Bay Area Governments (ABAG), the City's Green Building program, and the City's website.

On February 2, 2006 the CEAC amended the motion adopted in October 2005 to read as follows:  
Action: Motioned, seconded, carried (Harris/Kibbey. For: MacKusick, Harris, Clear, Kibbey. Against: None. Abstain: Hale, Moret. Absent: None.) to adopt the draft “ That Council require the City Manager to institute the following policy:

- a. No new tritium signs to be purchased or installed in new City owned and leased buildings;
- b. The City must provide an inventory of all tritium exit signs in City owned and leased buildings within six months;
- c. The City should provide facilities maintenance staff and subcontractors the training to recognize such signs and properly remove and legally dispose of them at the end of their useful life.

The Toxics Management Division or other agency should train the Public Works staff on proper handling and disposal for these signs. The following should be included as part of the training:

- a. Signs must be removed in an intact state prior to demolition, or remodeling. Signs removed during normal replacement must also be removed intact. Removed signs must be returned to the manufacturer or other appropriate agency.
- b. Identify the appropriate agency, if any, for notification of theft of signs. Prompt notification of the appropriate agency upon discovery of theft.
- c. Safe procedure for prompt clean up and proper disposal of any broken signs and associated contaminated clean up material.

With the recommendation to add in item “c” above “or when broken” as a friendly amendment.

<sup>1</sup> [Mark E. Linsey, “Lessons Learned in Dealing with Self Luminous Exit Signs”, The Radiation Safety Journal, Vol. 88, Suppl. 1, February 2005, S22 - S23]

#### RATIONALE FOR RECOMMENDATION

The rationale is three fold: To reduce the low potential for adverse health impacts on breaking an exit sign; To reduce the liabilities for improper disposal; To reduce the potential for a clean up requirement by a responsible agency.

#### ALTERNATIVE ACTIONS CONSIDERED

The CEAC considered the temporary use of tritium exit signs for difficult situations however, it would be difficult to define difficult situations or what constitutes a temporary use. In light of the existence of alternatives, it was decided to simplify the process.

#### CITY MANAGER

See companion report.

#### CONTACT PERSON

Nabil Al-Hadithy, Manager, Toxics Management Division, 981-7461

Attachment:

1. Resolution

PHASE-OUT OF TRITIUM EXIT SIGNS FOR THE CITY OF BERKELEY

WHEREAS, tritium exit signs contain up to 15 curies of radioactive materials; and

WHEREAS, the City of Berkeley assumes significant liabilities for improper disposal or accidental breakages when using tritium exit signs; and

WHEREAS, individuals have a potential to be exposed to tritiated water which can pose a significant health risk; and

WHEREAS, reasonable alternatives exist for tritium exit signs; and

WHEREAS, adopting of this policy will add to the proposed Berkeley's precautionary principle.

NOW THEREFORE, BE IT RESOLVED that the Council of the City of Berkeley requires a permanent ban on the purchase of tritium exit signs.

BE IT FURTHER RESOLVED, that the Council requires an inventory of all tritium exit signs in city-owned and leased buildings.

BE IT FURTHER RESOLVED, that the Council require staff to recognize such signs and properly remove and legally dispose of them at the end of their useful life or when broken.

BE IT FURTHER RESOLVED, that the Council require tritium signs to be added to the list of banned products for environmentally preferable purchasing products.