

Waste Lamps & Ballasts

This document provides guidance to companies and individuals that create and/or manage waste lamps and ballasts. Complete management regulations can be found in the Code of Federal Regulations (CFR), Title 40, Part 273 and 261 and the Oregon Administrative Rule (OAR) Chapter 340, Division 113.

12/9/02 By: R. Volpel, State of Oregon DEQ

Environmental concerns:

Fluorescent lamps and High Intensity Discharge (HID) lamps, including mercury vapor, high-pressure sodium, and metal halide lamps from businesses, can contain levels of mercury and lead that make them hazardous waste when disposed. Mercury and lead are toxic metals that can accumulate in living tissue and cause adverse health effects. Businesses and government in Oregon discard several million lamps each year, making these lamps the largest source of mercury in our solid waste-stream.

When a lamp is broken, or placed in a landfill or incinerator, metals are released into the environment that may contaminate the air, surface or groundwater.

Lamp ballasts manufactured prior to 1978 likely contain polychlorinated biphenyls (PCBs). When released into the environment, PCBs persist for many years and bioaccumulate in organisms. Studies have shown that PCBs cause cancer in animals, and repeated exposure to PCBs has shown adverse reproductive and developmental effects in animals. Exposure to PCBs can cause liver damage, nausea, dizziness, eye irritation and bronchitis in humans.

Management of lamps as Universal Waste:

The universal waste rule was designed to encourage the collection of certain hazardous wastes that are generated by a wide variety of businesses and institutions. Depending on your individual situation, other options may be preferred to managing your waste lamps as universal waste.

Advantages of Managing Waste Lamps under the Universal Waste rule are:

- Universal wastes are not counted towards hazardous waste generator status;
- No manifesting required unless the waste lamps are transported through states or treated or disposed in states that do not recognize mercury-containing lamps as a universal waste;
- Increased storage time available; and reduced administrative requirements for record-keeping, training, and emergency preparedness.

Universal Waste Management requirements:

Handlers of waste lamps managed under the universal waste rule must:

- Manage lamps in a way that prevents releases of the waste to the environment;
- Contain lamps in containers such as cardboard boxes or fiber drums, which are adequate to prevent breakage;
- Keep containers closed;
- Minimize lamp breakage and immediately clean up any broken or damaged lamps; and,
- Store broken lamps in a closed, structurally sound container.

Universal waste handlers are prohibited from crushing lamps, or diluting lamps with other wastes. Waste lamps must be sent to a universal waste destination facility for recycling or disposal.

Labeling and Marking:

Each container of waste lamps must be labeled or marked clearly with one of the following phrases: "Universal Waste--Lamps", "Waste Lamps," or "Used Lamps."

Accumulation Time:

Waste lamps may be accumulated for up to 1 year.

Accumulation of universal waste lamps longer than 1 year is permitted if the handler can demonstrate, if inspected by DEQ, that more time is needed to accumulate the quantities necessary to facilitate proper recovery, treatment or disposal.

CONTRACTOR SAFETY BULLETIN ON PCB BALLASTS

The simple task of removing and replacing light fixture ballasts can also be the one that exposes you to the most liability for potential fines. For many years, lighting retrofit and energy conservation projects in schools and high rise office buildings have exposed you and your electricians to PCB containing ballasts. PolyChlorinated Biphenyls or PCBs are classified as hazardous waste and are regulated under the Federal Toxic Substances Control Act (TSCA).

The EPA enforces this act through 40 CFR Part 761 and can levy fines up to \$33,000.00 a day for up to 180 days for improper handling, storage, recordkeeping, and disposal of PCB containing items. OSHA can also levy penalties under the HazCom and PPE standards. To complicate matters, there is confusion on proper handling and disposal procedures from our customers, transporters and general contractors. This confusion has led to deficiencies in our work practices and greatly increased our likelihood of monetary penalties from these regulating agencies.

NECA – IBEW Electrical Contractors who engage in lighting maintenance work activities must review the PCB Remediation guidelines to minimize exposure to fines from the EPA and OSHA. These guidelines have been reviewed by the EPA for accuracy and should be used on future projects where exposure to PCBs is known or likely.

The PCB Remediation guidelines include information on:

- EPA Requirements for Generators (our customers) of PCB waste
- EPA Notification of PCB Activity
- EPA ID # Requirements
- EPA PCB Remediation Plan Requirements (sample plan)
- Required PPE for Electrician PCB Exposure and Training Topics
- Proper Ballast Handling and Storage Procedures
- Typical Spill Kit Contents and Clean up Procedures
- Hazardous Waste Transportation and Disposal Procedures
- Manifesting Requirements
- Recordkeeping

ELECTRICAL CONTRACTOR RESPONSIBILITIES

The more you handle PCB contaminated ballasts, the greater the possibility of citations from either the EPA or OSHA. Typical to any other electrical job task, an assessment of potential hazards is necessary to establish training and PPE requirements. Direct hazards associated with PCB ballast removal include electrical shock, chemical exposure and ladder / aerial lift use. Indirect hazards involve DOT exposures, storage and transportation issues.

General training on electrical safety, lockout / tagout, HazCom and ladders should be completed prior to the project. Specific training to PCB exposure and the safe and proper handling of contaminated ballasts, clean up procedures and PPE is a must. This training must include accidental spill and cleanup procedures.

Best Practice guidelines for PCB ballast removal include:

It is extremely important to review bid documents and contract language to identify specific requirements that may hold you accountable for long-term environmental liability

Inform customer and / or general contractor that a PCB remediation plan must be submitted to the EPA, by the generator, 30 days in advance of work being performed. See PCB Generator Responsibilities.

Ask for a copy of any site assessments to establish where PCB ballasts are to be expected. If the building was built prior to 1979, it is reasonable to expect the ballasts containing PCB's to be found throughout the facility. (See flowchart – DEQ Schools Doc.)

When removing PCB ballasts, ensure that your electricians are wearing appropriate PPE. Safety glasses and nitrile gloves should be used at a minimum for a standard non-leaking PCB ballast removal. For spill clean up or leaking PCB ballast removal, PPE should include safety glasses, nitrile gloves and disposable lab coat. Disposable booties, a faceshield and a half face respirator with organic vapor cartridges may also be necessary.

For specific procedures for spill cleanup and repair of leaking, smoking or smelling PCB ballasts, refer to the sample PCB Remediation Plan. See appendix C.

A licensed hazardous waste transporter must establish containment and transportation procedures for PCB ballasts, contaminated PPE and clean up materials. This typically includes DOT approved and labeled containers that can be sealed for transport. Never transport these items back to your shop. Leave with customer if necessary. At a minimum, double bag these items in zip lock

bags and have your customer sign that they received them. Use customer responsibility and release form. See appendix D.

Ballasts manufactured after 1985 can be assumed to be Non-PCB containing ballasts. These ballasts and equipment are not regulated by TCSA. Recycling of these items is recommended. Contractor disposal at a public or private waste disposal site, with prior clearance, is allowed.

Transportation and disposal of PCB ballasts and equipment is regulated by TSCA and requires a generator identification number (issued by EPA) and a uniform hazardous waste manifest. EPA form 8700-22 (Rev. 3-05)

The generator must obtain the identification number from the EPA. ID numbers are site and building specific. DOT / EPA manifesting is required.

Manifesting responsibilities rest with the generator of the hazardous waste. Do not have your employees sign the manifest document. The EPA ID # is the number that is unique to the physical location of the PCB ballasts and is provided by the customer – not the electrical contractor.

NOTE:

If you must assume the liabilities of a generator due to business practices, refer to Generator Responsibilities.

PROCEDURES FOR PERFORMING SERVICE WORK

EPA does not restrict the disposal of intact, non-leaking ballasts or capacitors. Therefore, there is no TSCA limit on how many small PCB capacitors and florescent ballast that may be disposed of as solid waste. It is recommended that the safest method to send all materials to an approved, licensed incineration site.

If you remove one or two ballast that contain PCBs, but it has been determined that they are INTACT AND NON – LEAKING, EPA permits transportation of these ballasts from the worksite to a solid waste disposal facility if the following conditions have been met:

- 1 Intact and Non – Leaking ballasts only.
- 2 Advance notice has been made to the solid waste disposal facility that has indicated acceptance of the intact and non-leaking PCB containing ballasts.
- 3 This is a PCB bulk product waste, which does not require labeling, manifesting or EPA number registration.

Obtain a receipt from the solid waste disposal facility, keep a copy for your records and provide one to the customer.

GENERATOR RESPONSIBILITIES

A generator of hazardous waste by definition is a person who, by virtue of ownership, management, or control, is responsible for causing or allowing to be caused the creation of hazardous waste.

As such, when performing PCB ballast remediation projects, the OWNER of the facility is generally considered to be the generator of the hazardous waste. The OWNER has specific responsibilities that must be met to avoid citations from the EPA. Your actions can also cause you to inherit the definition of co-generator and those responsibilities are now shared between you and the owner.

You do not want these responsibilities and should make every effort to notify the owner and / or general contractor that you are excluding these duties from the scope of work.

The generator has the responsibility to:

Obtain an EPA identification # that is unique to the location where the PCB ballasts are to be removed. See appendix A. (Notification of PCB Activity)

Notify the EPA of PCB activity (See appendix A. Notification of PCB Activity) and submit a PCB remediation plan (See appendix C, Sample Remediation Plan) 30 days in advance of work taking place.

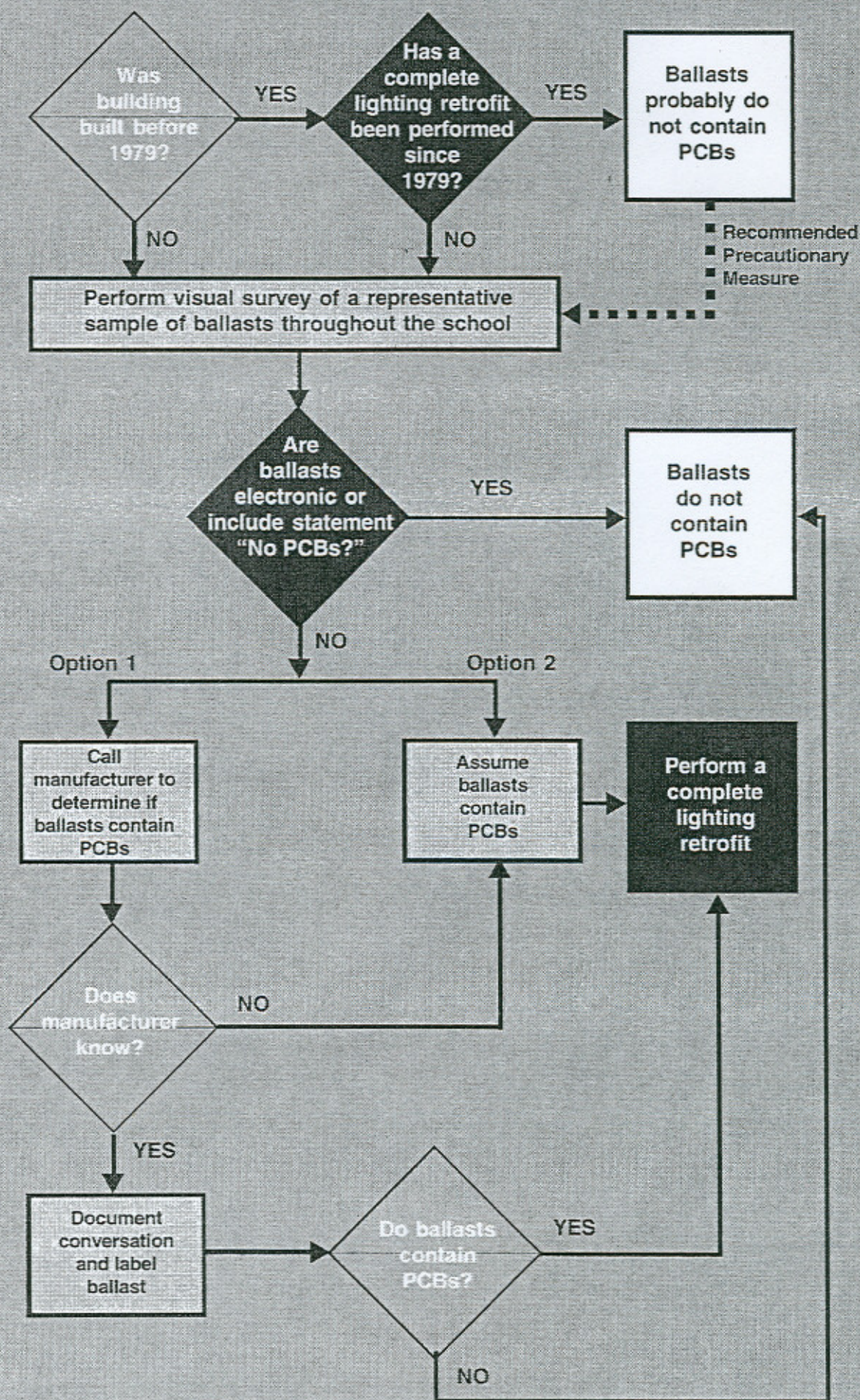
A PCB remediation plan may include a site assessment to determine the amount and location of PCB containing ballasts. If an assessment has been performed, secure a copy and retain with your records.

Transportation and disposal of PCB ballasts and equipment is regulated by TSCA and DOT. Records of shipping and handling procedures are documented on a Uniform Hazardous Waste Manifest. See appendix B.

The generator is ultimately responsible to ensure that PCB ballasts and contaminated equipment is properly shipped to the appropriate hazardous waste handling facility. The waste materials must be shipped using a licensed hazardous waste transportation company.

The hazardous waste handling facility will issue a receipt or certificate of destruction. These documents are to be maintained by the generator for a period of three years.

Figure 1: How to Identify PCB-containing Ballasts



CUSTOMER RESPONSIBILITY AND RELEASE FORM

This document is intended to inform you, our customer, about specific handling and disposal requirements for PCB containing light fixture ballasts and equipment.

The EPA, under the Toxic Substances Control Act (TSCA), regulates PCBs and as such, only licensed hazardous waste transportation companies can deliver your defective PCB containing ballasts to an approved disposal facility.

Therefore we have sealed the PCB contaminated ballasts and equipment in double containment bags and are leaving them at this work site. All transportation and disposal arrangements will be left up to you.

For more PCB disposal information, contact Dan Duncan @ EPA region X @ 206-553-6693 or Bruce Long @ 503-326-3686 .

I have verified that _____ electric has double bagged all PCB containing materials and have received a copy of the customer responsibility and release form.

(customer or company representative)

(date)

(electrician)

(date)

USEPA
 United States
Environmental Protection Agency
 Washington, DC 20460

 Form Approved
 OMB No. 2070-0112

Notification of PCB Activity

For Official Use Only

Return To:

Fibers & Organics Branch (7404T)
 Office of Pollution Prevention & Toxics
 U.S. Environmental Protection Agency
 1200 Pennsylvania Ave., N.W.
 Washington, DC 20460-0001

1. Name of Facility

Name of Owner Facility

2. EPA Identification Number (if already assigned under RCRA)

3. Facility Mailing Address (Street or PO Box, City, State, & Zip Code)

4. Location of Facility (No. Street, City, State, & Zip Code)

5. Installation Contact (Name and Title)

6. Type of PCB Activity (Mark 'X' in appropriate box. See Instructions.)

- | | |
|---|---|
| <input type="checkbox"/> A. Generator w/onsite storage facility | <input type="checkbox"/> B. Storer (Commercial) |
| <input type="checkbox"/> C. Transporter | <input type="checkbox"/> D. R&D/Treatability |
| <input type="checkbox"/> E. Approved Disposer | <input type="checkbox"/> F. Scrap Metal Recovery Oven/Smelter,
High Efficiency Boilers |

Telephone Number (Area Code and Number)

7. Certification

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate, and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as a company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate, and complete.

Signature

Name and Official Title (Type of Print)

Date Signed

Paperwork Reduction Act Notice

The annual public burden for this collection of information is estimated to average 0.57 hours per response. This estimate includes time for reading instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden to: Director, Collection Strategies Division, U.S. Environmental Protection Agency (mail code 2822), 1200 Pennsylvania Ave., N.W., Washington, D.C. 20460-0001. Include the OMB number identified above in any correspondence. Do not send the completed form to this address. The actual information or form should be submitted in accordance with the instructions accompanying the form, or as specified in the corresponding regulations.

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number	
5. Generator's Name and Mailing Address			Generator's Site Address (if different than mailing address)			
Generator's Phone:						
6. Transporter 1 Company Name				U.S. EPA ID Number		
7. Transporter 2 Company Name				U.S. EPA ID Number		
8. Designated Facility Name and Site Address				U.S. EPA ID Number		
Facility's Phone:						
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
		No.	Type			
1.						
2.						
3.						
4.						
14. Special Handling Instructions and Additional Information						
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.						
Generator's/Offeor's Printed/Typed Name				Signature		Month Day Year
16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: _____ Date leaving U.S.: _____						
17. Transporter Acknowledgment of Receipt of Materials						
Transporter 1 Printed/Typed Name				Signature		Month Day Year
Transporter 2 Printed/Typed Name				Signature		Month Day Year
18. Discrepancy						
18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection						
Manifest Reference Number: _____						
18b. Alternate Facility (or Generator)				U.S. EPA ID Number		
Facility's Phone:						
18c. Signature of Alternate Facility (or Generator)				Signature		Month Day Year
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)						
1.	2.	3.	4.			
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a						
Printed/Typed Name				Signature		Month Day Year

APPENDIX C

SAMPLE RE-MEDIATION PLAN

Poly-Chlorinated Biphenyls (PCB's) Re-mediation Plan

(Insert Customers Name Here) has a contract with (insert Contractor Name) to retrofit all existing light fixtures. Said contractor has hired (Insert Electrical Contractor Name) to be the sub-contractor for the express purpose of (name scope of work: example; removing all existing fixtures and replace with energy efficient fixtures).

Procedures for correct identification and recycle or disposal of lamps and ballasts:

1. Approach the fixture and examine it for any obvious leaks that may have come from ballasts. This would be a brown tar like or burnt coffee looking substance.
2. If there is evidence of contamination, mark the fixture. This will be a marker so you can find the fixture at a later time.
3. Turn off the power and allow the ballast to cool.
4. After the fixture has cooled remove the tubes.
5. Put the tubes in a container provided by the recycler/disposal company.
6. If using the packing boxes LABEL the boxes: "used fluorescent tubes", "universal waste", "mercury containing tubes."
7. If those boxes are not available use the boxes from the new tubes.
8. Pack the tubes tightly to limit the possibility of damage.
9. Seal the box with tape.
10. Check the ballast. Ballasts made after 1978 do not contain PCB's and should be labeled "no PCB's". If no such label is on the ballast we must assume the ballast is PCB containing.
11. If the ballast contains no PCB's put them in a container with like kind. Always ensure that non-PCB containing ballasts and ballasts containing PCB's are kept segregated and are in two different locations.
12. If the ballast contains PCB's and/or is LEAKING mark the fixture with an identifying mark for ease of identification at a later time.
13. (Insert Customers Name Here) will contact the appropriate disposal-company to pick up the barrel. A manifest or chain of custody will be maintained.
14. Upon proper disposal a disposal certificate will be issued by the disposal-company to the (Insert Customers Name Here).

Standard Operating Procedures for PCB Re-mediation

WARNING- HAZARDOUS MATERIALS

PCBs (polychlorinated biphenyls) are known animal carcinogens and possible human carcinogens. Exposure must be avoided. Exposure routes include inhalation (lungs), ingestion (eating), and absorption (skin contact).

To avoid exposure, do not inhale the smoke or fumes, or make skin contact with any PCB containing compound, and do not put contaminated tools in your mouth. Properly handle, decontaminate, package, and/or dispose of PCB contaminated articles or clothing. Do not take contaminated clothing home. Personal clothing contaminated with PCBs must be disposed of as regulated waste.

Use of cleaning solvent, especially acetone, require mechanical ventilation and may require the use of a respirator with organic vapor cartridges. Forced air ventilation with fans, and open doors and windows is always preferred to remain within Permissible Exposure Limits (PELs).

A. Specific Procedures for Spill Cleanup and Repair of Leaking, Smoking, or Smelling PCB Ballast.

1. Apply general safety precautions applicable to the electrical industry.
2. Keep unauthorized personnel out of the room until re-mediation is completed.
3. Keep the lights/lamps turned off to prevent additional ballast damage.
4. Secure entrances and label accordingly to prevent unauthorized entry during PCB re-mediation activities.
5. Let leaking or smoking ballast cool at least 20 minutes after lights are shut off. There is a thermal burn hazard when dealing with hot ballast or hot potting (leaking) materials.
6. The room must be ventilated and clear of smoke, otherwise wear a respirator with organic vapor cartridges.

Continue to ventilate the room even if respirators are worn. Closed rooms must be actively ventilated with fans and preferable directly to the outside. Contaminated spaces must be unoccupied and ventilated until the next day.

7. Re-mediation workers must wear appropriate PPE for the task being completed.
8. Lay down plastic sheeting under each ballast and light fixture to be worked on.
9. Access fluorescent lamps and remove the lamps.
10. Caution: Potential Thermal Burn! When the ballast is cool, remove it. Identify the ballast as "No PCB" or "PCB" type. Wrap the ballast in paper towels and place in a double plastic bag.
11. If the ballast is a "No PCB" type and there is no past contamination from a previous ballast leak then proceed to replace the ballast. PPE is not required and discard cleaning materials and ballast.

12. Clean up PCB contaminated leaks using the following guidelines:

- a. Draw a diagram indicating where contamination is found.
- b. Avoid unnecessary spreading of PCB material during the clean up.
- c. Leaks onto nonabsorbent surfaces can be initially cleaned with rags or paper towels or, if hardened, by using a putty knife. Remember not to mix contaminated tools with "clean" tools or with clean materials and be sure to decontaminate your tools after the job.

- d. Perform a double wash procedure. Wash contaminated areas and the light fixture cavity with a specified solvent or detergent and then wipe rinse with rubbing alcohol. Our preference is mineral spirits/paint thinner, but acetone can be used on difficult areas but it may remove the paint. Repeat the wash procedure a second time. Washing with a solvent or detergent should be done in a way to minimize any liquid residue. Absorb all liquids in rags or paper towels. Be careful not to contaminate stock containers of solvents or detergents. Pump-sprayers work well for the solvents and help to reduce contamination of stock solvent.
 - e. When dry, outline a 10-centimeter (four-inch) square at the original point of contamination. Clean-up sampling is required by EPA regulation, for every leak.
 - f. If leaks occur onto highly absorbent materials such as carpet, clothing, etc., the contaminated area must be cut out and disposed of as PCB waste.
 - g. Place all contaminated materials in double plastic bags. Separate the ballast from all other contaminated materials (i.e., debris) such as gloved, ground cloths, rags, paper towels, lab coats, etc. Seal with tape and label.
13. Wash hands after cleaning up.
 14. Conduct a wipe test. Are your hands washed and all PCB contaminated materials in double plastic bags? Be sure not to contaminate the test kit. Using the test kit, wipe a 10-centimeter by 10-centimeter area (approximately a four inch square) about the center of the contaminated point. Making a 10-cm template/cutout will speed the work. Conduct one wipe test per fixture.
 15. Label the test kit with date, time (24 clock), location #, fixture #, and your name.
 16. Install "PCB Free" ballast.
 17. Install a low mercury (ecologically friendly) lamp, if available, and close up the light fixture. Remember to properly dispose of mercury containing lamps per EPA/DOE guidance.
 18. Dispose of the PCB contaminated material in the appropriate PCB waste drums. Ballast and contaminated debris must be separated into different drums.

B. Decontamination and Re-mediation Materials List

1. Gloves; use neoprene, butyl rubber, or nitrile (nitrile is preferred).
2. Goggles, face shield or safety glasses with brow shield.
3. Disposable lab coat.
4. Disposable overshoe/bootie.
5. Disposable hat.
6. Clean rags or clean paper towels.
7. Large plastic trash bags.
8. Tape.
9. Permanent marking pen.
10. Tag and tie.
11. Light weight plastic ground cloths.
12. Cleaning solvents. Use full strength. Options include mineral spirits, turpentine, deodorized kerosene, or rubbing alcohol. Mineral spirits and rubbing alcohol are the preferred stock items. Acetone may be purchased separately but only small quantities should be kept on hand due to its volatility. Be aware that acetone will damage and/or remove paint, even baked on enamel.
13. Cleaning detergents. Detergents that contain "Tri-Sodium Phosphate (TSP)" may be used instead of solvents. TSP detergents may be available at larger grocery stores or at home improvement centers. Use full strength and apply with a damp rag to prevent forming wastewater. Using a detergent has advantages over solvents because they are less flammable, less odorous, and they may be less damaging to certain finishes.

