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CS ENERGY PROCEDURE

MANAGEMENT OF PCB-FILLED CAPACITORS AND PCB-CONTAMINATED TRANSFORMER OIL CS-OHS-7

Responsible Manager: Production Environmental Manager
Responsible Executive: EGM Corporate Services

DOCUMENT HISTORY

Key Changes	Prepared By	Checked By	Approved By	Date
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CONTENTS

DOCUMENT HISTORY		1
1	PURPOSE	3
2	SCOPE	3
3	ACTIONS	3
	3.1 Identification	3
	3.1.1 Identification by Visual Means (Capacitors Only)	3
	3.1.2 Identification by Chemical Testing	3
	3.2 Labelling	4
	3.3 Handling	4
	3.3.1 General Handling Guidelines	4
	3.3.2 Personal Protective Equipment	5
	3.4 Material Safety Data Sheet (MSDS)	5
	3.5 Emergency Procedures	5
	3.5.1 Procedures for Minor Spills	6
	3.5.2 Procedures for Major Spills	6
	3.5.3 Fires	6
	3.6 Storage	6
	3.7 Disposal	7
	3.8 Training	7
	3.9 PCB Register	8
	3.10 First Aid and Health Monitoring	8
4	DEFINITIONS	10
5	REFERENCES	10
6	RECORDS MANAGEMENT	10
7	ATTACHMENTS	10
	7.1 Attachment 1 – Storage Requirements	10
	7.2 Attachment 2 – PCB Classification	11

1 PURPOSE

This document provides guidelines for the management of PCB-filled capacitors and PCB-contaminated transformer oil at CS Energy locations.

2 SCOPE

This document applies to PCB's within capacitors and transformers.

3 ACTIONS

3.1 Identification

PCB's are very stable compounds. Because they are very good insulators and fire resistant, they were used in electrical components such as capacitors and transformers. In capacitors, PCB's are a sticky liquid, colourless or yellow in colour. PCB's in leaking capacitors are a darker colour due to contamination with other materials.

3.1.1 Identification by Visual Means (Capacitors Only)

Capacitors containing PCB's are usually encased within a soldered or welded metal case. Capacitors that are PCB-free are usually encased within a plastic casing or material of similar properties to plastic. In fluorescent light fittings, a PCB capacitor is likely to have one or more of the following characteristics:

- a resonant start;
- a date mark from the 1950's, 1960's or 1970's;
- a capacitor that is round, cylindrical or rectangular, encased in an aluminium container with a weld running all the way around the top edge with two terminals with quick connect tags;
- a capacitor encased in a rectangular tin container with soldered seams;
- a slightly heavier capacitor (compared to similar types of capacitors manufactured after the 1970's)

If a capacitor is leaking, treat it as if it contains PCB's, unless you have definite proof that PCB is not present. This may be in the form of a label, either from:

- the manufacturer; or
- previous testing that has certified the capacitor PCB free.
- Insert bullet-points as required (Arial Font – 11 pt)

3.1.2 Identification by Chemical Testing

To be identified as containing PCB, a sample of the capacitor/transformer oil is usually required for testing. This can be tested in a number of ways:

- a) in the field, by chlor-an-oil kits, and Dexsil L2000 analyser, by authorised field testers, a register of which is held on file SW 353/36/14 - Occupational Safety & Incidents - Polychlorinated Biphenyls (PCB's); or
- b) in the laboratory, by accredited techniques.

Laboratories which are accredited and registered by NATA, or approved equivalents within Australia

shall carry out laboratory analysis. Analyses shall report the PCB concentration present in the sample. Where analyses are required for regulatory purposes, the quality assurance program shall incorporate periodic check analyses by an independent laboratory.

3.2 Labelling

Capacitors/transformers identified as containing PCB's are to be identified by affixing a prominent adhesive sticker. These stickers will have the following characteristics:

- yellow background with black writing.
- labelled CAUTION THIS CAPACITOR/TRANSFORMER CONTAINS PCB.

However, many of the capacitors at each CS Energy worksite may not have been checked for PCB's, so if a capacitor is unlabelled, assume that it may contain PCB's, and treat it accordingly.

3.3 Handling

3.3.1 General Handling Guidelines

Insulation oil in capacitors varies in its measured contamination level of PCB. The following guidelines should therefore be followed:

- follow manufacturer's storage and handling recommendations;
- avoid all personal contact, including inhalation;
- wear protective clothing and gloves when handling;
- avoid damaging containers, and handle gently;
- avoid contact with incompatible materials, particularly chlorine;
- when handling, DO NOT eat, drink or smoke;
- wash hands with soap and water after handling;
- if non-disposable work clothes are used, CS Energy becomes responsible for laundering or disposal of the clothing; if they are to be reused, they must be laundered separately from other clothing; this process is to be controlled and administered by the Risk and Safety Adviser;
- disposable overalls are to be used in preference to non-disposable overalls.

If PCB's get into the worker's eyes, they should be flushed with water for 15 minutes and medical advice

sought.

3.3.2 Personal Protective Equipment

PPE shall be available from the store.

The storeperson shall be responsible for maintaining PPE supplies.

In ventilated areas, the following minimum equipment is to be used:

- safety glasses with side shields, or chemical goggles; a full face shield is recommended when working on overhead equipment;
- impervious gloves, which may be viton, polyethylene, polyvinyl alcohol, polytetrafluoroethylene, butyl rubber, nitrile rubber, or neoprene;
- DO NOT USE gloves made of polyvinyl chloride (PVC) or natural rubber (latex);
- protective footwear;
- PVC non-absorbent disposable type overalls made of TYVEK laminated with PVC;

If inhalation risk exists, wear SAA approved organic-vapour respirator. In confined areas or where ventilation is inadequate, a full face respirator with supplied air is to be used.

3.4 Material Safety Data Sheet (MSDS)

The MSDS for PCB's is available on the Chemalert program, UN 2315.

3.5 Emergency Procedures

Since PCB's are not biodegradable, every effort is to be made to prevent them entering the environment

and the food chain.

In the event of a PCB spill incident, the Environmental staff shall be notified immediately.

3.5.1 Procedures for Minor Spills

- avoid breathing vapours, or contact with skin and eyes;
- wear protective clothing, gloves, and safety glasses;
- contain spill with sand, earth, or vermiculite;
- wipe up and absorb small quantities with vermiculite or other absorbent material;
- place spilled material in clean, dry, sealable, labelled container;

3.5.2 Procedures for Major Spills

- clear area of personnel, and alert fire brigade;
- wear full body protective clothing with breathing apparatus;
- prevent spill from entering drains of water courses by any practical means;
- contain spill with sand, earth, or vermiculite;
- after clean up, decontaminate and launder all protective clothing - destroy if grossly contaminated;
- Site Environmental staff will determine advice to the Environmental Protection Agency and Emergency Services.

3.5.3 Fires

- foam;
- alcohol stable foam;
- dry chemical powder;
- clear area of personnel and move upwind;
- alert Fire Brigade with location and nature of hazard;
- wear full body protective clothing with breathing apparatus;
- prevent spill from entering drains of water courses by any practical means;
- cool fire exposed containers with water spray from a protected location;
- avoid spraying water onto liquid pools; and
- if safe to do so, remove containers from path of fire.

3.6 Storage

The PCB-filled capacitors are to be stored in clearly labelled containers, which are :

- within a stored, securely sealed, dry, well-ventilated area, away from foodstuff containers;
- periodically inspected for spills, leaks, and for rust, or other structural faults, and arrangements made for replacement as necessary;

- the PCB - containing capacitors should be wrapped in heavy plastic bags and placed with the terminals upwards in the storage container specifically for PCB - containing capacitors;
- the associated PCB - contaminated disposable gloves, overalls and rags shall be disposed of in the storage container specifically for associated PCB waste.

Storage containers for each type of PCB waste can be used for the PCB storage and disposal process. These storage drums shall be clearly labelled as storing PCB contaminants.

AVOID STORING PCB's WITH OXIDISERS; SEGREGATE FROM CHLORINE.

Adequate personal protective equipment, clean up materials and equipment shall be kept in a secure area external and adjacent to the entry of the storage area. Conspicuous notices warning that containers of PCB wastes are stored within the area shall be attached to the door of the storage area.

- Transformers containing PCB contaminated oil shall be periodically inspected for spills, leaks, and for rust, or other structural faults, and arrangements made for repairs as necessary;

3.7 Disposal

PCB's are not biodegradable, and every effort must be made to avoid their entry into the environment and the food chain. Due to their environmental persistence and potential health hazard, PCB's cannot be disposed of in landfills or dumped at sea. The only way to safely destroy PCB's is in special high temperature incinerators. There are only a few licensed waste operators, which have this type of facility, and are able to dispose of PCB waste. When transformer oil containing PCB's is to be removed and disposed of, the oil shall be removed in an environmentally responsible manner, and the Environmental staff notified before removal commences by a licensed disposal company. Records shall be kept to demonstrate the responsible disposal of all scheduled PCB material, and a certificate of disposal shall be obtained from licensed treatment facilities as a record of such disposal.

All packages containing PCB wastes shall be clearly marked with details of the contents in accordance with the Australian Code for the Transport of Dangerous Goods by Road and Rail as amended, as applicable to Dangerous Goods Class 9.

3.8 Training

Awareness training on the presence of PCB's throughout CS Energy work sites shall be implemented for all staff. This will be the responsibility of the Risk and Safety Adviser, and shall be in the form of (safety

committees, notices posted on noticeboards etc).

Safety inductions for persons working directly with PCB's shall include:

- recognising PCB's;
- PPE when handling PCB's;
- first aid after contact with PCB's;
- emergency procedures for spills, leaks, and fires.

Contractors working on site with electrical equipment must receive the PCB safety induction.

The Training Department shall conduct refresher training annually for existing staff.

Training records shall be maintained by the Training Department and shall include:

- trainer;
- trainee;
- date of training; and
- training content.

3.9 PCB Register

A PCB Register shall be established and maintained by the Electrical Engineer or delegated person. The Register shall contain the following:

- areas contaminated by PCB's;
- dates of inspection;
- persons undertaking inspection;
- dates of removal;
- persons responsible; and
- quantities involved.

3.10 First Aid and Health Monitoring

Health assessments shall be available to workers or contractors where:

- PCB's are ingested;
- inhalation of PCB vapours or fumes occurs; or
- direct skin contact is made with PCB contaminated material.

Records shall be kept for any exposure to scheduled or non-scheduled PCB waste (refer sections 3.7.1 and 3.7.2 definitions of these concentrations). The Occupational Health Nurse shall keep the exposure

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records with the following details:

- date of exposure;
- circumstances of exposure;
- persons involved;
- estimated quantities and concentration of PCB's; and
- date of medical follow-ups, if appropriate.

Recommendations for treatment excluding confidential medical information may be provided to management

4 DEFINITIONS

Term	Definition
MSDS	Material Safety Data Sheet
PCB	Polychlorinated Biphenyl
PPE	Personal Protective Equipment

5 REFERENCES

Reference No	Reference Title	Author
	MSDS, Chemalert, 1997	
	Polychlorinated Biphenyls Management Plan, 1996.	
	The Management of PCB's in the Queensland Electricity Supply Industry, 1996.	
	Phasing Out Small PCB Holdings, New Zealand Ministry of Health, 1995.	

6 RECORDS MANAGEMENT

In order to maintain continual improvement, suitability, safety and effectiveness of the organisation, CS Energy's registered documents will be reviewed on a two-yearly basis or at intervals specified by legislative or regulatory requirements. Review of controlled documents should occur where it has been identified that there are changes in technology, legislation, standards, regulation or where experience identifies the need for alteration to the content. Registered documents should also be reviewed following an incident, change management process, modification or where directed as part of a risk assessment process. A 'review' can simply mean that it has been identified, confirmed and appropriately recorded that no changes are required and that the existing process remains the same.

CS Energy must ensure that records are retained according to accountability, legal, administrative, financial, commercial and operational requirements and expectations. In compliance with records retention and disposal, all documentation created in relation to CS Energy business must be retained in line with minimum retention periods as detailed in legal retention and disposal schedules.

7 ATTACHMENTS

7.1 Attachment 1 – Storage Requirements

Storage containers shall be stored in dedicated and identified areas complying with the following

requirements:

- located at an elevation above the 100 year flood level for the site;
- constructed so as to prevent the ingress of stormwater;
- roofed and walled to adequately protect the contents from the weather;
- secure to prevent unlawful entry;
- be adequately ventilated;
- surrounded by a bund wall which encloses a volume of 110% of the contents of the largest individual container, or 25% of the maximum contents of the store, whichever is greater;
- impermeable floor sealed to prevent adsorption of any spillage and have no penetrations or other connections to drains or waterways;
- located no closer to any storage (other than underground) of:
 - * flammable or combustible liquids than permitted for protected works by AS 1940;
 - * LPG than permitted for protected works by AS 1596;

but in any case, not less than 12 metres.

7.2 Attachment 2 – PCB Classification

PCB contamination is classified into several categories:

Concentrated PCB and Scheduled PCB Solid or Liquid Material and Waste

- scheduled PCB material contains > 50mg/kg or > 50g;
- concentrated PCB material is scheduled PCB material containing 10% or more of PCB's by mass;
- disposal must be by authorised agency;
- waste must not be diluted or disaggregated so that scheduled PCB waste becomes non-scheduled PCB waste;
- scheduled PCB solid or liquid waste must not go to landfill, or elsewhere in the environment;

Non-Scheduled PCB Solid or Liquid Material and Waste

- contains < 50 mg/kg or < 50g;
- non-scheduled liquid PCB waste shall not be disposed of to landfill or elsewhere in the environment;
- non-scheduled solid PCB waste with a concentration of PCB's less than the threshold concentration may be disposed of to a landfill approved in accordance with the PCB management plan 1996;

Large amounts of PCB's (> 10kgs) are to be reported to the Environmental Protection Agency.

Materials and wastes containing less than 2.0 mg/kg of PCB's are not considered to be PCB materials for regulatory purposes.