Information note on metal theft and electrical equipment

Background

The EPA has become aware of instances of metal theft and vandalism of industrial type electrical equipment and is bringing to your attention potential associated hazards. The equipment involved can in certain instances contain oils some of which include polychlorinated biphenyls (PCBs). A recent theft involved capacitors containing PCBs and some switchgear from a derelict site is currently the subject of an investigation by the Gardaí. Work carried out by the EPA has found vacant industrial sites are particularly at risk.

The EPA has prepared this informational note to provide you with information that will be of use should you come across this type of equipment on a site or at a waste permit holder's site including at scrap metal yards.

Information on PCBs

PCBs are oily substances with excellent electrical insulation and heat transfer properties. These characteristics led to their widespread use in a variety of industrial, commercial and domestic applications until issues with their toxicity became apparent. PCBs were widely used as insulating oils in electrical equipment such as transformers, switchgear and capacitors up until the mid-1980s. Any oil filled electrical equipment older than 1989 has the potential to contain PCBs and should be assumed as doing so until proven otherwise.

PCBs are recognised as posing a threat to human health (World Health Organisation) and the environment (United Nations Environment Programme) because of their toxicity, persistence and tendency to bioaccumulate (i.e. to build up in the bodies of animals, particularly at the top of the food chain). PCBs can enter the body by skin contact, inhalation and ingestion of contaminated water or food. Once exposed to PCBs, these chemicals can collect in fat tissue where they can be stored for long periods.

Legal Obligations

All holders of more than 5 litres of PCB-contaminated oils with PCB concentrations above 500ppm should have disposed of this oil in an environmentally sound manner before 31 December 2010. If you become aware of a PCB holding or locate this equipment on a site that is not permitted for this type of waste please email PCBS@epa.ie to advise of your finding.

Additional Information

If you need additional information in relation to electrical equipment containing PCBs or if you suspect you know where PCB-contaminated equipment may be located, please email PCBS@epa.ie or the EPA's resource use unit via Helen Searson at 01 2681000 or Martin Doyle at 053 9160600.

Types of Equipment

There are three main types of electrical equipment involved:

1. Transformers;
2. Capacitors; and
3. Large Electrical Switches (commonly called Switchgear).

NOTE THAT UNDER NO CIRCUMSTANCES SHOULD YOU APPROACH INDUSTIAL ELECTRICAL EQUIPMENT UNTIL IT HAS BEEN DEEMED SAFE BY A SUITABLY QUALIFIED ELECTRICIAN OR ELECTRICAL ENGINEER.

Transformers

Transformers are largest of the equipment types and can contain up to 1000 kg of oil. They consist of a metal casing containing a bath of oil in which is located copper windings around a non-conductive core all fixed on a support of wood or other material. Due to their copper content transformers are vandalised and the copper removed with the resulting spillage of the oil bath. This can give rise to ground contamination and in certain cases the oil can contain PCBs exacerbating the contamination issue. With the increase in metal theft (particularly from vacant industrial sites) experienced in Ireland this is becoming a more common occurrence and local authorities when made aware of such spillages should investigate the likelihood of PCB contamination and consider action to ensure adequate clean-up of contaminated sites. Special care should be taken when undertaking such investigations due to the hazardous nature of PCBs.

Image 1: Inside of a transformer

Image 2: Pole mounted Transformer

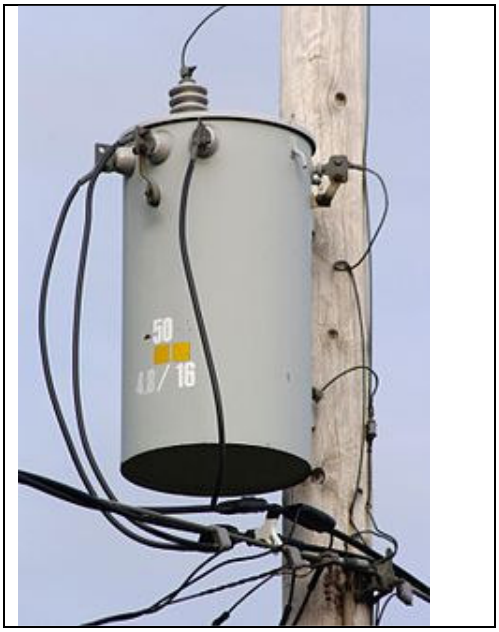

Image 3: Large Industrial Transformer

Transformers usually have a manufacturer's plate on them listing the date of manufacture, serial number and information on the oil fill within them. If the transformer is older than 1989 or has no

plate it should be considered as containing PCBs unless analysis results are available to prove otherwise. Often they also have a drain on them to allow their oil to be refilled when needed during their operation. If oil is apparent on the manufacturers plate, do not touch the plate, instead, request the owner provide the details.

Capacitors

Capacitors are significantly smaller pieces of electrical equipment that can contain oil fills of between 1 and 20 litres. In certain cases they are found in arrays in industrial installations with up to 20 capacitors operating together. Sometimes these arrays are called "power factor correction units" or "PFCUs". Each capacitor is normally labelled containing information on its' manufacturer and the date on which is was produced. Those containing PCBs are often labelled "**pcb**" or include the words "**Pyrlene**" "**Clophen**" or "**Askeral**". Brands that have been found to be PCB containing include **Rectiphase**, **Frako**, **Esta**, **Micafil**, **Bosch**, **BICC, J & P (Johnson & Philips) and Baugatz**. If there is no label on the capacitor it should be considered as PCB contaminated.

These units are usually sealed and have to be ruptured to release their contents and consequently in their whole form do not pose as significant a risk as other more open applications.

Image 3: Rectiphase Pyralene (PCB) containing capacitor

Image 5: Array of Baugatz capacitors (capacitors are the lower set of boxes below)

Image 6: Manufacturer's label on a Baugatz Capacitor

Image 7: Frako Capacitors which can contain PCBs (small cyclinders in picture below)

Switchgear

Industrial Switchgear is electrical switches which can contain oil as an insulator. They can contain up to 200 litres of oil fill. Like transformers ,switchgear often has a manufacturers plate which may state the year of manufacture if it is older than 1989 or has no plate it should be considered as containing PCBs unless analysis results are available to prove otherwise. Many more modern switches do not contain any insulating oil but use gas (e.g. SF_6) as an insulator.

Image 8: Yorkshire Switchgear

Image 9: Large Industrial Switchgear