

FIREFIGHTING AND ELECTRICITY

Electric Wires in Houses and Buildings on Fire

Electricity is usually supplied to homes at 230 volts. Voltage to industrial plants and commercial buildings may be 230 or 400 volts, but can be 11,000 volts or higher in large industrial installations. In some fire situations, it may be necessary to switch off a power switch. This is one time when your insulated rubber gloves and protectors may help.

Switching off switches under normal conditions is not hazardous. However, the fire may introduce a fault condition which may overload the switch at the time of operation.

To minimise the problem, do the following:

- Stand to one side of the switch
- Turn your eyes away while operating the switch

The electrical hazards are increased when flooding and wet conditions exist in buildings. Any open wires (even low voltage) can be lethal if you place yourself between the live wire and the wet ground surroundings.

Extreme caution is called for in this situation. The only safe way is to shut off the power before you enter the building.

Pole Mounted Electrical Equipment

Transformers

There are several hazards to be aware of when fighting transformer type fires.

Transformers are devices used to step up or step down voltages. They contain, usually, large volumes of insulating oil which, of course, is combustible and has a flash point of 145°C.

Basically, a transformer consists of an iron core on which is placed two or three coils of conductors. By varying the numbers of turns on the coils, the voltage can be changed.

The turns on the coils need to be insulated from one another to withstand the voltages. The insulation is usually combustible paper.

For both cooling and insulating purposes, transformers are placed in large metal tanks. Further refinements can include pumps, fans, radiators and a large tank at the top of the main transformer called the conservator, which also contains oil.

Usually it is possible to extinguish transformer fires before all the oil has been consumed, thereby saving adjacent equipment from damage. No attempt should be made to extinguish transformer fires until the electricity authority has confirmed that it is safe to do so. Burning oil at ground level can be extinguished where it presents other dangers.

Transformers have porcelain bushings fixed on the lid or sides. The function of these bushings is simply to let the high voltage transformer connection pass through the earthed metal tanks. Typically they contain the same insulating material found in transformers – paper and oil. When subjected to high temperatures the porcelain material can explode. This could result in flying projectiles and more oil as fuel for the fire. Be aware!

Circuit Breakers

These are large switches. Some types of circuit breakers are equipped with porcelain bushings and combustible oil.

Hazards are described as above.

Circuit breakers are rarely mounted on poles in metropolitan areas; they are more often used in rural lines.

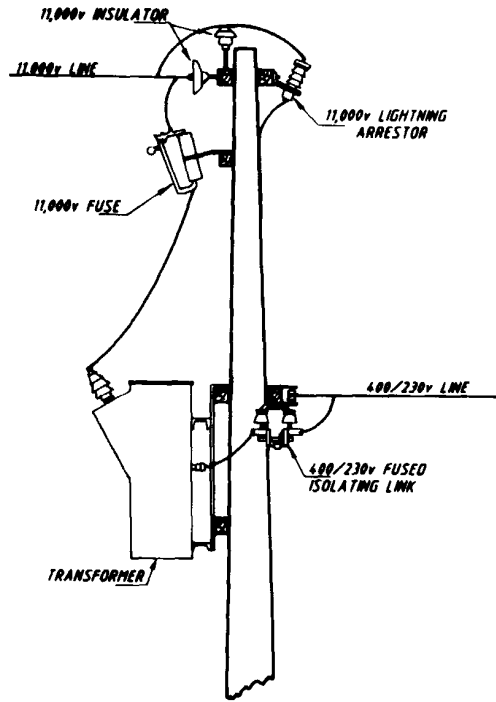
Capacitors

Capacitors may be mounted on some line poles in metropolitan areas. A capacitor bank is comprised of a number of small units (often 3) in a typical installation.

There are three main hazards to be aware of from a firefighting viewpoint:

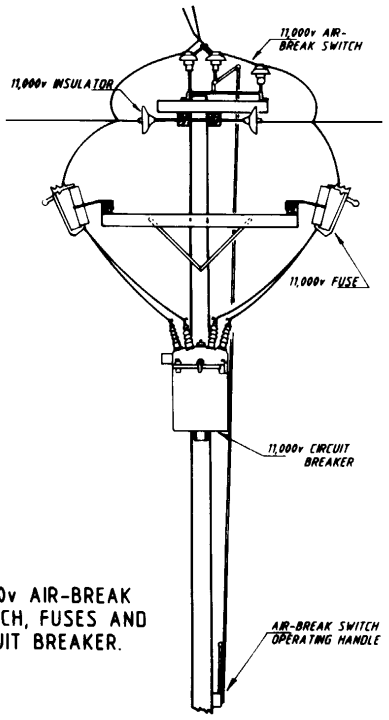
The individual capacitors are sealed units which could explode when heated.

Some capacitors contain polychlorinated biphenyl's (PCB's) which can be hazardous to your health and the environment. In the event of a spill, electricity supply authority personnel will be involved in containment and cleanup once the fire has been extinguished. Capacitors can store electrical energy even with then power off. They can produce lethal voltages. Treat them as alive until advised to the contrary by electricity supply authority personnel. The rescue of a person who is apparently unconscious owing to contact with two electrical wires above the ground on a pole should not be attempted by a person untrained in pole top rescue.



POLE MOUNTED TRANSFORMER

#23



11,000v AIR-BREAK SWITCH, FUSES AND CIRCUIT BREAKER.