INSTRUCTIONS

Recommended Maintenance For
ORGANIC INSULATION
In High-Voltage Air Circuit Breakers

Organic insulating materials are used in high voltage air circuit breakers for pole unit supports, operating rods, barriers, braces, arc chutes and similar purposes, where it has been found to be more suitable than porcelain. The material used on Westinghouse breakers is Micarta, which has a long established record for insulating and mechanical dependability. To ensure long continued electrical resistance, the Micarta surface is protected with high grade insulating varnish which may be either clear or pigmented, depending on the place of use and the apparatus design requirements.

The purpose of the varnish is to retard moisture absorption and to provide an easily cleaned surface. Like all other insulating surfaces, whether organic or inorganic, a varnished Micarta surface should receive periodic attention in order to maintain the insulation resistance at the highest possible value.

The objects of maintenance are two-fold, first to remove dust and other foreign air borne materials as well as chemical oxides which result from aging of the varnish, and second to make sure that the varnish provides a continuous protective film over the entire insulating surface.

In addition to the usually recommended periodic equipment inspections, on breakers that have been in service for three to five years, the insulation should be inspected, cleaned, and the varnish renewed if the surface indicates it to be needed.

CLEANING

While the surface of the insulation is dry, contamination does not usually cause any large change in insulation value. However, if while it is present, moisture is added in the form of condensation, or by more direct means, the surface electrical leakage may be greatly increased, even to the point of electrical breakdown. The first object of maintenance therefore is cleaning. A clean varnished surface will be smooth, glossy, and free from foreign material either loose or adhering to the surface.

To obtain a clean surface, it is necessary to loosen the adhesive dirt by scrubbing and washing. This is best accomplished in the following manner:

1. Wash with normal heptane, obtainable from the major oil companies such as Esso Standard. Use clean paper towels wet in the heptane. Use a fresh towel on each part.

Caution: Heptane is inflammable and no open flames or sparks should be allowed near the work.

2. After the heptane has evaporated, which requires only a minute or two, wash with de-ionized water, sometimes called demineralized water, or distilled water.

Note: De-ionized or demineralized water can be obtained in small quantities from many firms that maintain chemical laboratories, particularly storage battery manufacturers or electroplaters.

Use fresh paper towels and keep the water in a handy size glass bottle. Wet the towel from the bottle, wash the part and dry immediately with a fresh towel. Use fresh towels for each part.

INSPECTION

When inspecting the insulating parts preparatory to cleaning, wipe off superficial dirt with a dry cloth and note the condition of the varnish and of the Micarta. If the varnish appears in good condition, i.e., fairly smooth and with liberal coverage, proceed with cleaning.

If the varnish appears thin, and is not uniform in coverage, is cracked, or can be peeled off with the fingernail, the parts should be revarnished.

VARNISHING

Varnishing can be done with the parts in position on the breaker, as follows:

1. Sandpaper when needed to remove loose varnish and wipe off all dust from sanding.

2. Apply three coats of varnish, Westinghouse M*135-2. Allow 24 hours drying time between coats at ordinary temperatures. Drying time may be decreased by preheating parts with infrared lamps to a temperature of 40 to 50 degrees C before applying varnish and likewise heating each coat for about 4 to 8 hours, or until the varnish has set up to the point where it will not be lifted by applying the succeeding coat.

Laminated Insulation. Resin bonded laminated insulating materials are formed under pressure at high temperature. The release of pressure, reduction of temperature and some further shrinking of the resin bond produces internal stresses. Relieving of these stresses may result in the formation of minute cracks or checks along the laminated edges of the insulation. Such cracks, if small, are sealed by the varnish and are not harmful.

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