Safe Work Practices

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1.0 GENERAL

1.1. An electrical capacitor is an electrical device that stores up electricity or electrical energy and improves an AC circuit's power factor. It has three essential parts. Two are usually metal plates separated and insulated by the third part, known as the dielectric. The capacitor's charge is dependent upon the size and spacing of the conducting plates and the type of insulating or dielectric medium between the plates.

1.2. The main reason for installing capacitors on our distribution system are for reducing line losses and improving system voltage. To be effective, capacitor banks must be installed where power factor improvement is greatest without causing leading power factor at light loads. Capacitor installations should be reviewed with the Engineering Department.

1.3. A capacitor is a little like a battery. Although they work in completely different ways, capacitors and batteries both store electrical energy. You know that a battery has two terminals. Inside the battery, chemical reactions produce electrons on one terminal and absorb electrons at the other. A capacitor is a much simpler device, and it cannot produce new electrons – it only stores them. Capacitors, as specified in our Standards Specification 1201 & 1202, do not contain any polychlorinated biphenyls (PCB's). The liquid dielectric is biodegradable and environmentally acceptable. However, they do contain chemicals and care should be taken to avoid spillage. Old capacitors containing PCB's are so labelled.

1.4. Capacitors must be carefully and properly applied. As previously stated, the purpose of a capacitor is to improve the power factor of the circuit. A capacitor only corrects the power factor from the capacitor back to the system. Capacitors have no power factor effect between the capacitor and the reactive load causing the power factor. Improperly applied capacitors can supply more reactive current than the load requires, resulting in a leading power factor and an increase in losses instead of a decrease. That is why capacitors are located after careful system study by qualified engineers.

2.0 TYPICAL INSTALLATION PROCEDURE

2.1 The Distribution Engineering Department decides the location and total kvar of capacitors to be installed in a bank by conducting a load/voltage survey.

2.2 Planning personnel will draw from Stores the desired quantity, voltage and size of capacitors needed to make up total kvar in the bank. Unit sizes in kvar per phase will be in accordance with Section '1200' of the Distribution Standards manual.

2.3 Engineering personnel initiate the capacitor installation report including name of the manufacturer, serial number, kvar and date tested.

2.4 The Line crew installs the bank as per Distribution Standard Drawing No. 1201 or 1202.

2.5 The location and date of installation are filled in the capacitor installation report and returned to the planner involved.

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3.0 MAINTENANCE/REMOVAL PROCEDURE (Versant Power Safety Manual 5.7.7.c.ii-vii)

3.1 All tanks and metal hangers for capacitor banks shall be effectively grounded.

3.2 Before working on capacitors they shall be disconnected from energized sources for at least five minutes, then short circuited across each terminal with a piece of wire attached to a hot-line stick.

3.3 Short circuiting may produce a spark or flash. Keep away, guard your face and wear eye protection.

3.4 Capacitors shall be disconnected from the energized source, short circuited and grounded to be considered de-energized.

3.5 Any line to which capacitors are connected shall be grounded before being considered de-energized.

3.6 Each capacitor unit shall be grounded between all insulated terminals and the tank before handling/transporting.

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