



## Equipment Protection for Three Phase Transformer Customers

### **"Single-Phasing"**

Electrical loads using three-phase power sources are subject to loss of one or all three phases due to a variety of reasons. A single-phasing condition occurs when the source of only one phase in a three-phase system is lost. The loss of a single phase on an electric utility's three-phase distribution system is usually caused by a blown fuse. A fuse on our distribution system may operate for a number of reasons including a downed overhead line, an underground cable failure or an animal contacting an overhead line. Single phasing can also be caused by a breaker or fuse operating within the customer's facility and can cause serious damage to a customer's three phase equipment if it does not have adequate loss of phase protection. During a single-phasing condition, loss of phase protection will shut off power supply to all three phases, which prevents the remaining phases from attempting to continue operating the equipment. When properly installed, loss of phase protection will help to prevent damage to your three-phase equipment.

### **Sensitive Electrical Equipment**

In addition to protecting the three-phase equipment from a single-phasing condition, it is also important to protect other sensitive electrical equipment from electrical transients or surges. An electrical surge is a short duration, high-energy impulse on the normal electrical power system whenever there is a sudden change in the electrical circuit. The most obvious source is from lightning, but surges can also come from normal utility switching operations. Surges may even come from within a building or facility from air conditioners, motors/pumps, or elevators, to name a few. Damage from electrical surges is one of the leading causes of electrical equipment failure. Surge protection that is properly installed is highly successful in preventing equipment damage, especially for sensitive electronic components found in most equipment today.

As stated in the City of Loveland, Power Operations Division, Requirements for Electric Service document:

*"Consistent with section 13.12.010 of the Loveland Municipal Code, the City will make every effort to provide a continuous reliable source of power to its customers. However, the City does not guarantee against irregularities or interruption. The City shall not be liable for injury to persons, damage to property, monetary loss, or loss of business related to interruptions of electric service or delays in furnishing electric service to a customer, whether planned or unplanned, and/or are due to causes or contingencies beyond the control of the City, including but not necessarily limited to: accidents, breakdown of equipment, inadequate supply of equipment, acts of God, floods, disease outbreak or epidemic, storms, fires, strikes, riots, war, or orders of government. Customers with equipment sensitive to service interruptions, voltage irregularities, single phasing, etc. are responsible for taking the necessary precautions to prevent damage from such events."*

### **Questions?**

If you have any questions or concerns about this information, feel free to contact Carl Woodworth, Customer Relations Business Specialist, at 970-962-3567 or [carl.woodworth@cityofloveland.org](mailto:carl.woodworth@cityofloveland.org).