

## SECTION 700

### CUSTOMER UTILIZATION EQUIPMENT

The Customer's service entrance and utilization equipment shall be installed in accordance with all local, state and National Electrical Code requirements. It is the intent of this section to provide the Customer with recommendations concerning factors that can affect both RPU and the Customer in the selection, installation, maintenance and operation of the Customer's utilization equipment. If concerns arise that are not covered in this section, RPU's Customer Service Representative should be contacted.

#### 701 Protection of Customer Equipment

The customer is advised to provide adequate protection against the effects of outages or voltage spikes in accordance with the NEC or other pertinent sources of information for all types of motors and other equipment.

Equipment that should be protected includes, but is not limited to:

- motors
- computers
- electronics equipment
- equipment in which computers or electronics form an integral operating part

Equipment should be protected under all conditions, including:

- overload
- loss of voltage
- high or low voltage
- loss of phase(s) (e.g. single phasing on polyphase motors)
- re-establishment of service after any of the foregoing
- phase reversal
- motors that cannot be subjected to full voltage on starting
- harmonics or wave form irregularities

Failure to provide such protection may result in needless damage to equipment and the expense of delay and repair.

Sensitive electronics, such as microprocessor-based home electronics and business computers, are susceptible to damage due to voltage spikes or surges.

Before any microprocessor-based electronics are installed:

- Wiring practices that meet manufacturer specifications need to be assured. (For example, proper grounding and dedicated circuits are important.)
- Consideration should be given to installing transient voltage surge suppression
  - at the main service entrance, and
  - at the point of use
- An uninterruptible power supply (battery backup) should be considered if a momentary voltage dip or outage would cause loss of data.

## **702 Motor Starting Currents**

Generally, all motors require a starting current substantially greater than their normal running current. Where starting currents are excessive, an abnormal drop in supply voltage will result. In order to minimize the unfavorable effects of such voltage drops, it is essential that the Customer's motors do not exceed the allowable starting characteristics as shown in Table 430-151 of the National Electric Code.

NOTE: Customers planning to install any motor larger than 5 hp single phase or 25 hp three phase, must contact the Customer Service Representative. Motor installations that cause power quality problems for other customers shall be corrected at the owner's expense.

### **703 Power Factor**

In order to improve the efficiency of RPU's distribution system, the Customer's utilization equipment shall maintain an average power factor as close to unity as possible.

Some of RPU's rate schedules include a demand charge and a penalty for an average power factor that is less than 95%. Details of the method of billing for such Customers can be obtained from the Customer Service Representative. For new services, it is suggested that the Customer's utilization equipment be designed for operation at high power factor or with capacitors that are switched on and off with the equipment. See Section 1000, Exhibit 11 for correcting customer's power factor.

RPU will calculate the power factor of Customers in designed rate classes by installing a varhour meter. See Section 601 for Customer's responsibilities in providing metering equipment.

### **704 Fault Currents**

The Customer's service equipment and other devices shall be adequate to withstand and interrupt the maximum available fault current. For single family residences with service equipment rated 200 amperes maximum and 120/240 volts, single phase, equipment shall have a minimum interrupting rating of 10,000 amperes symmetrical and other equipment shall be braced to withstand that minimum value.

### **705 Wiring Adequacy**

The National Electrical Code (NFPA No. 70) specifies the adequacy of wiring with respect to safety but such installations may not be efficient, convenient, or adequate for good service of future expansion of electrical use. In many instances, the installation of wiring capacity greater than minimum code requirements is strongly recommended.

## **706 Customer-Owned Generating Equipment**

Unless authorized by written agreement, electric generating equipment installed by the Customer shall not be interconnected or operated in parallel with RPU system. The customer shall own, install, operate, and maintain electrical interlocking equipment which will prevent parallel operation and such equipment shall be approved by RPU prior to installation. Any cogeneration facilities will conform to the written RPU Cogeneration Policy.

## **707 Energy Conservation**

RPU encourages the prudent and efficient use of the electric power and energy which it provides. Customers desiring special information or other assistance regarding the efficient end use of electricity should contact a Customer Service Representative at 507.280.1500.

## **708 Customer's Obligations**

708.1 Increased Load. In the event the Customer desires to increase load materially, such as additional electric heat, increased motor loads, etc., they shall give RPU sufficient advance notice, so that RPU may provide added facilities if necessary. If the Customer fails to notify RPU and RPU's equipment is damaged as a result of such increase in load, the Customer shall reimburse and make payment to RPU for all such damages.

708.2 Balancing of Load. Except in the case of three-phase, four-wire delta services, the current unbalance in three-phase services shall not exceed 10 percent of the current that would be required at maximum load under balanced conditions.

708.3 Total Harmonic Distortion (THD).

708.3a The application of any nonlinear load by the Customer (e.g., static power converters, arc furnaces, adjustable speed drive systems, etc.) shall not cause voltage and/or current Total Harmonic Distortion (THD) levels greater than industry accepted levels on RPU's electric system at the point of power delivery to the Customer's facility.

708.3b The Customer shall disclose to RPU all nonlinear loads prior to connection. RPU may test the Customer's load to determine the THD levels.

708.3c It shall be the responsibility of the Customer to assure that the THD requirements are met, including the purchase of necessary filtering equipment. Any load found not in compliance with this policy shall be corrected immediately by the Customer at the Customer's expense. If not corrected, RPU may disconnect service to the Customer's facility.

708.3d The Customer shall be liable for all damages, losses, claims, costs, expenses and liabilities of any kind or nature arising out of, caused by, or in any way connected with the application by the Customer of any nonlinear load operating with maximum THD levels in excess of the values stated in 708.3a. The Customer shall hold harmless and indemnify RPU from and against any claims, losses, costs of investigation, expenses, reasonable attorneys' fees, damages and liabilities of any kind or nature arising out of, caused by, or in any way connected with the application by the Customer of any nonlinear load operating with maximum THD levels in excess of the values stated in 708.3a.