CHAPTER 6

ELECTRIC SERVICE RULES – SPECIAL EQUIPMENT & MOTORS

600. SCOPE

△ **A.** Customer electrical equipment (welders, arc furnaces, motors driven compressors, instantaneous water heaters, motors and other equipment) having highly fluctuating or large instantaneous demands, when compared to their average demands or with loads which cause harmonic distortion (some large computers and variable speed controllers) or other electrical disturbances, are discussed in this chapter. Formerly labeled as "service impairing", these unique characteristics and variations can impair quality of service to other Customers and shall be eliminated or controlled with performance limits determined by Alliant Energy. The Customer shall install equipment that causes minimum service impairment or install corrective equipment at the load location.

B. Where Alliant Energy's electrical supply facilities are adequate and have ample capacity to serve normal load additions, all Alliant Energy costs for additional facilities, metering, and alterations specifically required to prevent impairment of service to other Customers, will be billed to the Customer installing service-impairing equipment

601. PHASE BALANCE EQUIPMENT.

The Customer shall balance electrical loads on the service entrance. Each phase conductor shall carry a minimum of 25% of the total KVA at maximum load conditions.

602. POWER FACTOR CORRECTION.

The use of equipment by the Customer for power factor correction shall conform to the requirements of Alliant Energy. The Customer may be required to limit the size of static capacitor installations or to maintain effective control of the capacitors in order to prevent the use of such equipment from causing excessive voltage at the service. Corrective equipment shall be installed on the load side of the service disconnecting device and metering.

603. ARC WELDERS.

A. The Customer shall consult Alliant Energy and obtain approval before installing transformer type arc welders or furnaces. Such equipment shall conform to Section 1301 of this Electric Service Rules and the Customer shall provide Alliant Energy with the following name plate information:

a. Manufacture, type, and serial number
b. Frequency

c. Primary volts
d. Maximum input amperes at rated output
e. Output volts at rated output amperes
f. Rated output amperes
g. Rated duty cycle
h. Temperature rise in Degrees C
i. Open circuit voltage.

B. Arc welders with a rated maximum operating input not in excess of 20 amperes may be used by residential customers or general service customers on the respective residential or general secondary service rate, if such use complies with the requirements in Section 1301. Larger arc welders will be given service under the applicable power rate.

604. PROTECTION AND CONTROL

A. The Customer shall be responsible for the protection against low voltage or phase loss wherever low voltage, phase loss, or unexpected restarting could cause damage to the Customer's equipment or result in personal injury.

B. Control apparatus equipped with reverse-phase relays of an approved type shall be installed by the Customer on all poly-phase motor installations for elevators, hoists cranes and those manufactured processes where accidental reversal of rotation is liable to cause injury to persons or damage to machinery, equipment or work in progress

605. MOTOR SPECIFICATIONS

A. Single-phase motors that are started manually, or automatically more than four times per hour are classified as frequently started motors. A frequently started motor may be connected to 120, 240, or 208-volt circuits provided its lock rotor current does not exceed 60 amperes.

B. A Motor started four or fewer times per hour may be connected to 120, 240 or 208 volt circuits provided its inrush current does not exceed 100 amperes. Customers contemplating the purchase of any three phase motors or single phase motors rated more than 5 horsepower, or having an inrush current greater than 100 amps, shall consult with Alliant Energy's engineering department regarding the capacity and character of service available. The cost of additional facilities (including soft start equipment) that may be necessary to maintain service to other Customers shall be at the expense of the Customer who creates the voltage problem.

Permitted Maximum Horsepower Single Phase Motors

Locked Rotor KVA Code	Maximum Horsepower Frequently Started Motors	Maximum Horsepower Frequently Started Motors	Maximum Horsepower Infrequently Started Motors	Maximum Horsepower Infrequently Started Motors
	120 Volt	208 or 240 Volt	120 Volt	208 or 240 Volt
A	2	3	3	7-1/2
B	2	3	3	5
C	2	3	3	5
D	1-1/2	3	3	5
E	1-1/2	2	2	5
F	1	2	2	3
G	1	2	2	3
H	1	1-1/2	1-1/2	3
J	1	1-1/2	1-1/2	3
K	¾	1	1-1/2	2
L	½	1	1	2
M	½	1	1	2
N	½	1	1	2
P	½	¾	1	1-1/2
R	1/3	¾	¾	1-1/2
S	1/3	¾	¾	1
T	1/3	½	½	1
U	1/3	½	½	1

Permitted Maximum Horsepower Three Phase Motors

Locked Rotor KVA	Maximum Horsepower Frequently Started Motors	Maximum Horsepower Infrequently Started Motors
A	5	10
B	5	10
C	5	10
D	3	7-1/2
E	3	7-1/2
F	3	7-1/2
G	3	5
H	2	5
J	2	5
K	2	3
L	2	3
M	1-1/2	3
N	1-1/2	3
P	1-1/2	3
R	1	2
S	1	2
T	1	2
U	1	1-1/2

C. **Air Conditioning** systems, including air-to-air and geothermal heat pumps, shall have **Locked Rotor Current** not to exceed 100 amps.(Locked Rotor Amps (LRA) is usually listed on the unit's nameplate.)
Exceeding this limit will often cause voltage dip/light flicker problems.

D. If service to any customer is negatively affected, the cost of additional facilities necessary to provide adequate service shall be at the expense of the customer who causes the problem.

Equipment Rated At	Total Locked Rotor Current Of All components started Simultaneously Not to Exceed
120 Volt	60 Amps
240 Volt – 20,000 BTU/HR or Less	60 Amps
240 Volt over 20,000 BTU/HR	Consult Alliant Energy