Date Adopted: 05/15/07
Date Revised:4/19/22
Date Reviewed:5/11/26
Policy 117
Electric Service Regulations

SUBJECT:

Electric Service Regulations

OBJECTIVES:

In view of Lower Yellowstone Rural Electric Cooperative's, (LYREC), responsibility as an electric utility operating within the States of Montana and North Dakota, it is essential that reasonably uniform voltage be maintained throughout the system to ensure proper operating power for all members.

POLICY:

Motor Starting Current Limitation

To provide for adequate and proper controls incident to voltage fluctuation, before installing a motor whose horsepower exceeds those stated in this policy, the member must submit full information on the motor.

LYREC shall have the right to require the member to install, at their expense, reduced voltage starting equipment, or other acceptable means of starting, on any new or existing motor which in LYREC's sole discretion could create undue disturbance on the power lines.

The sizes of a single-phase and three-phase motors that will be permitted on the system, and the determination of locked rotor currents shall be in accordance with the following conditions:

PROCEDURE:

A. Single Phase Motors – Size Permitted
   a. Single phase, infrequently started motors may be operated at 120 volts provided their locked rotor current does not exceed 45 amperes.
   b. Single phase, frequently started motors may be operated at 120 volts provided their locked rotor current does not exceed 25 amperes.
   c. Single phase motors of 7.5 HP or less may be operated at 208, 240 or 460 volts except that when the name plate rating is higher than 5 HP, compensating starting equipment shall be installed to limit starting current. In locations where three-phase service is not available, single-phase motors larger than 7.5 HP may be operated only with the express written consent of LYREC.
   d. All single phase motors exceeding the limitations of paragraphs (a.) and (b.) above must be operated at 208, 240 volts and the locked rotor currents must not exceed the following ampere size in the following table. For 460 volt services, the cooperative must be consulted for locked rotor currents.

Maximum Permissible Locked Rotor Current for Single Phase Motors
(Amperes at Motor Terminals)

HP	AMPS
1 and smaller	35

1.5.....40
2.....50
3.....70
5.....100
7.5.....110

B. Three Phase Motors – Size Permitted

a. In general, three phase motors of 10 HP or less nameplate rating operating at 208, 240 or 480 volts, may be equipped for across line starting; motors larger than 10 HP may use across line starting in some instances, depending on the frequency of starting, location, etc. Such cases shall be referred to the cooperative for written approval. Reduced voltage starting equipment, when required, will be furnished by the member.

b. Three phase motors rated at 208, 220 or 440 volts must have locked rotor currents which do not exceed the amperes at the motor terminals in the following table. Current values listed in these tables are those corresponding to the rated nameplate voltages of the motors. Tests or specified current values for other voltages shall be adjusted to the rated voltage of the motor.

c.

Maximum Permissible Locked Rotor Current for Three Phase Motors (Amperes At Motor Terminals)

	Motor Voltage Rating		
Horsepower	208	220-240	440-480
5 and below	92	87	44
7.5	122	115	58
10	149	141	71
15	208	197	99
20	266	251	126
25	322	304	152
30	381	360	180
35	392	370	185
40	402	380	190
50	423	400	200

d. For motors above 50 HP and/or for voltages above 460 volts the cooperative must be consulted for determination of permissible locked rotor current.

e. When a single piece of motor driven apparatus has more than one motor starting simultaneously, the sum of the maximum starting currents of those motors starting simultaneously, and also the sum of the horsepower rating shall be used in applying the above tables. For test purposes, the starting current of motorized equipment may be considered at 75% of the locked rotor current.

C. Determination Of Locked Rotor Currents:

a. Locked rotor currents are obtainable from motor manufacturers or may be calculated from the nameplate data on the motor as follows:

1. Obtain HP, voltage and Code Letter Rating from the motor nameplate.

2. Obtain the kVa per horsepower with locked rotor for the motor by referring to the following tabulation taken from Section 430.7(B) of the *National Electric Code* and selecting the value that corresponds to the Code Letter Rating of the motor from Table 430.7(B).
3. Calculate locked rotor amperes by the following formulas:

Single Phase Motor - - $\frac{\text{Locked rotor amps} = 1000 \times \text{locked rotor kVa per HP from Table} \times \text{HP rating of motor}}{\text{Voltage Rating of Motor}}$

Three-Phase Motor - - $\frac{\text{Locked rotor amps} = 1000 \times \text{locked rotor kVa per HP from Table} \times \text{HP rating of motor}}{1.73 \times \text{Voltage Rating of Motor}}$

Code Letter	TABLE kVa per HP with locked rotor
A	0 - - 3.14
B	3.15 - - 3.54
C	3.55 - - 3.99
D	4.0 - - 4.49
E	4.5 - - 4.99
F	5.0 - - 5.59
G	5.6 - - 6.29
H	6.3 - - 7.09
J	7.1 - - 7.99
K	8.0 - - 8.99
L	9.0 - - 9.99
M	10.0 - - 11.19
N	11.2 - - 12.49
P	12.5 - - 13.99
R	14.0 - - 15.99
S	16.0 - - 17.99
T	18.0 - - 19.99
U	20.0 - - 22.39
V	22.4 - - and up

b. The locked rotor currents specified in the above tables are for average conditions only. In areas where frequent starting of motors will interfere with the electrical service to other customers supplied from the same secondary and primary lines, the cooperative reserves the right to limit locked rotor currents to values smaller than those determined herein.